

Title: Reintroduction of EU-Exit transitional arrangements for import of treated seeds and parallel products IA No: NA RPC Reference No: RPC-DEFRA-5290(1) Lead department or agency: DEFRA Other departments or agencies: N/A	Impact Assessment (IA)		
	Date: 19/10/2023		
	Stage: Final		
	Source of intervention: Domestic		
	Type of measure: Secondary legislation		
Contact for enquiries: pesticides@defra.gov.uk			
Summary: Intervention and Options			RPC Opinion: GREEN

Cost of Preferred (or more likely) Option (in 2019 prices)

Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status Qualifying provision
£704.5m	£704.7m	£-124.3m	

What is the problem under consideration? Why is government action or intervention necessary?

The issues being addressed are (1) the end of the parallel trade permit scheme for plant protection products (PPPs) in GB, and (2) GB product authorisations for seed treatments imported under EU-Exit transitional arrangements will end this year. These issues could lead to shortages and higher prices of some PPPs and significant impacts on yield of key crops such as maize which is widely used in the dairy and anaerobic digestion sector. The government is best placed to resolve the issue as it is uniquely positioned to provide GB growers access to the EU market for these parallel products and non-GB authorised seed treatments.

What are the policy objectives of the action or intervention and the intended effects?

The policy objectives are:

- To ensure crop security for relevant sectors, including the dairy industry and anaerobic digestion energy generation by harvest of spring crops in 2024.
- To avoid the increase of operating costs and food prices for businesses and consumers due to specified limited pest control options by spring sowing 2024.
- To avoid significant negative impacts to the environment and human health in the timeframe of the intervention.
- To enable a long-term transition away from reliance on EU parallel products and imported seed treatments.

The main effect of the proposed action is to (a) allow treated seeds to be placed on the market and used in GB as long as the PPP used to treat them was authorised for that use in at least one EU or EEA Member State immediately before Implementation Period completion date for a further 3.5 years; and (b) allow permits to be issued for any PPP for a further 2 years in relation to which there was a valid Parallel Trade Permit (PTP) in place on 31 December 2022 provided that the GB reference product is still authorised.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

The baseline is the “do nothing” option in which parallel import permits remain withdrawn and the use of parallel products ends in June 2024, and the import of unauthorised seed treatments ends on 31st Dec 2023.

The preferred option would (1) enable the GB regulator to grant new parallel trade permits for 2 years which replicate those that were previously issued and valid in Dec 2022 and (2) grant a 3.5-year extension to the current treated seeds transitional arrangement which currently finishes at the end of Dec 2023. This option is preferred as it ensures crop security and limits cost increases within the required time constraints.

The non-regulatory option is an information campaign to encourage growers to use non-chemical pest control methods and grow substitute crops. This is not pursued due to low likelihood of being effective and inability to deliver in time.

Will the policy be reviewed? It will not be reviewed. If applicable, set review date: Month/Year				
Is this measure likely to impact on international trade and investment?			No	
Are any of these organisations in scope?		Micro Yes	Small Yes	Medium Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)			Traded: NA	Non-traded: NA

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

..... Mark Spencer

Date:

..... 22/10/2023

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 4	Net Benefit (Present Value (PV)) (£m)		
			Low: 521.0	High: 756.4	Best Estimate: 704.5

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.4	2.9	11.8
High	0.2	1.7	6.8
Best Estimate	0.3	2.5	10.2

Description and scale of key monetised costs by 'main affected groups'

Manufacturers and distributors of non-parallel pesticide products would be the main business group negatively affected by the proposals and we estimate that they will lose profit equal to what would have been sold in the absence of parallel trade. The GB regulator would also incur a small cost associated with the processing of parallel permits which would be underwritten by Defra (not included in the figures above). Note that the low / high figures above reflect the costs for the low / high NPV scenarios, rather than the low and high cost range.

Other key non-monetised costs by 'main affected groups'

There are two key non-monetised costs. The first is the potential additional cost to manufacturers and distributors of non-parallel pesticide products associated with the forgone profit derived from price increases in the baseline. We deem this impact as indirect and have not estimated central values due to evidence limitations, although indicative estimates are provided. The second is the cost to the environment and human health from greater risk of counterfeit products (parallel trade) and unauthorised GB seed treatments. This is not monetised due to evidence limitations and is set out in more detail in the Wider Impacts section of the evidence base.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	137.4	527.8
High	0.0	202.0	768.2
Best Estimate	0.0	187.1	714.7

Description and scale of key monetised benefits by 'main affected groups'

For treated seeds, we expect that growers (direct) and users (indirect) of maize will benefit from more profitable crop production and better productivity from use of maize (mainly dairy and anaerobic digestion production). For parallel imports, importers and distributors of parallel products will likely gain profits from being able to sell parallel products into the market and pesticide users (mainly farmers and amenity users) will gain from lower prices for the small portion of the market served by parallel imports.

Other key non-monetised benefits by 'main affected groups'

The key non-monetised benefit is the potential reduction in cost to pesticide users associated with lower pesticide prices due to parallel import competition. We deem this impact as indirect and have not estimated central values due to evidence limitations, although indicative estimates are provided. Another non-monetised benefit is the potential productivity benefit to pesticide users from parallel imports preventing supply gaps relative to the baseline. Again, the degree to which baseline supply gaps would arise is uncertain.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5
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The most sensitive assumptions made are that (a) most growers of maize would choose to grow alternative crops in the baseline, (b) 90% of cattle farms and 50% of anaerobic digestion businesses grow their own maize, (c) there is a 18% price differential between parallel and non-parallel products, and (d) parallel imports comprise 3.5% of market share in GB. The key risks are (i) impacts on environmental and human health as a result of pesticide use enabled by the proposals and (ii) delays to the legislative timetable that would mean seed treatments could not be imported in time for spring sowing in 2024.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 2.6	Benefits: 126.9	Net: -124.3	
			-497.2

Evidence Base

Problem under consideration and rationale for intervention

This assessment covers the impact of two different legislative changes related to pesticides that will be brought forward using the same statutory instrument. These proposed changes would enable the continued import of 'seed treatments' and 'parallel products'. We explain the problem and rationale for intervention, in turn, below.

Seed Treatments

Post EU-exit transitional arrangements enable seeds treated with products authorised for use in at least one EU member state to continue to be imported, marketed and used in GB up until 31 December 2023. When these arrangements end, several seed treatments currently relied upon by GB growers will be unavailable as they do not have GB product authorisations. This will impact their ability to control certain pests and diseases on some crops, which in turn will affect good crop establishment and yield.

The issue being addressed is the lack of GB product authorisations for some seed treatments that are currently imported from the EU and used by farmers and growers in GB. The issue has arisen due to a combination of a lack of applications and a lack of alternative methods to control pests targeted by these seed treatments. This issue therefore needs time to be resolved through a long-term solution.

The current or future harms being tackled are the negative impact of losing these seed treatments on crop growth in key agricultural sectors. Stakeholder intelligence suggests that the main areas that will be affected are maize for animal feed and anaerobic digestion, and certain horticulture crops. The proposed government intervention could prevent cases of crop failure or would at least mean that businesses in these sectors do not experience increases in operating costs and / or reductions in output which would arise from more limited pest control options. Some of this avoided cost saving is also likely to feed through to avoided food price increases for consumers.

The government is best placed to resolve the issue as it is uniquely positioned to provide GB growers access to the EU market for these non-GB authorised products. There are other options to resolve the issue without this intervention, but they do not offer a comprehensive solution. HSE, in its role as the UK and GB pesticide regulator, has raised this issue with the seed industry since EU exit, advising that they prepare for the end of the transition period by submitting applications for seed treatments, however no applications have been successful since EU exit. In the short term, the use of emergency authorisations and extensions of authorisations for minor uses could enable continued access to some of these products. Emergency authorisations allow the limited and controlled use of a PPP in special circumstances and extensions of authorisations for minor uses are limited in use. However, they do not provide a comprehensive solution to the problem.

Parallel Trade

The issue being addressed is the end of the parallel trade permit scheme for plant protection products (PPPs) in GB, which may lead to shortages and higher prices of some PPPs. The parallel trade permit scheme allowed PPP suppliers to import PPPs that were not authorised in GB, but were identical to GB-authorized products, from other EU countries. This scheme was possible when the UK was an EU Member State, and it helped to keep costs down and deal with shortages of some PPPs. However, after the UK left the EU, the scheme came to an end as of December 2022 in GB. When the permits expired, the Health and Safety Executive (HSE) put grace periods in place which allowed existing stocks to be sold until 30 June 2023 and used until 30 June 2024. Parallel trade coming to an end may create problems for PPP users who rely on these products for profitable operation of their agricultural activities.

The current or future harms that are being tackled are the potential negative impacts on the agricultural sector due to reduced availability and affordability of PPPs. If the government does not intervene, some PPP users may face difficulties in obtaining the PPPs they need and/or may have to pay higher prices for them. This could reduce their productivity and profitability leading to knock-on impacts to food prices and domestic food security and cost of amenity services.

The stakeholders most likely to be most significantly affected if the government does intervene are:

- Manufacturers, distributors, and importers of PPPs, who may face increased competition or reduced demand for their products depending on whether they hold GB authorisations / parallel permits. PPP users will also be impacted.
- PPP users, who may benefit from lower prices and greater choice of PPPs if the government intervenes.
- Consumers, who may avoid food price inflation and amenity price increases resulting from reduced PPP availability.
- HSE, who may have to re-issue parallel trade permits and enforce them under the proposed intervention.
- The environment and public health, which may be affected by the potential use of PPPs that contain contaminants, impurities, or incorrect active concentrations.

The government is best placed to resolve the issue as it is uniquely positioned to provide the GB market access to parallel products. The issue could not be resolved without intervention because there is no other way in which to introduce new competition into the market in the short timeframe without providing access to parallel products.

Rationale and evidence to justify the level of analysis used in the IA (proportionality approach)

We believe that the level of analysis used in this IA is proportionate as we estimate that the range of direct costs to business and EANDCB are accurate to within 90% confidence (this is tested during sensitivity analysis). Throughout the IA, especially in the monetisation of costs and benefit section, we consider whether the analysis to estimate each direct impact is proportionate. Where we perceive the effect of uncertainty in the calculations to be significant (>5% impact on EANDCB), detailed analysis is provided, and uncertainty in evidence is accounted for in sensitivity testing and the high / low range. Otherwise, higher-level calculation methods are used.

Although there are evidence gaps associated with estimation of some of the indirect impacts of the measures (in particular, price changes resulting from reintroducing parallel trade), these are not included in the EANDCB and therefore require a less rigorous assessment. We have included detailed qualitative analysis where this is the case.

Policy objectives

The policy objectives are set out below:

- To ensure crop security for relevant sectors, including the dairy industry and anaerobic digestion energy generation by harvest of spring crops in 2024.
- To avoid the increase of operating costs and food prices for businesses and consumers due to specified limited pest control options by spring sowing 2024.
- To avoid significant negative impacts to the environment and human health in the timeframe of the intervention.
- To enable a long-term transition away from reliance on parallel products and imported seed treatments.

To assess the longlist of options, we chose the following success factors, based on the objectives above and more general departmental objectives:

- **Alleviates price and supply issues:** to what extent does the policy option prevent price increases and supply gaps for pesticide users and the wider sector, and ensure crop supply security for key affected sectors.
- **Risks to the environment and human health:** to what extent are significant negative impacts to the environment and human health avoided.
- **Implementation in time:** to what extent does the policy deliver to the stated time objectives above.

- **Public sector cost:** to what extent does the policy impose additional burdens on governmental departments or arms-length bodies.

Description of options considered

The options that we consider would most effectively meet our policy objectives are outlined below. Prior to selecting these options, we considered other alternatives that may have met our policy objectives, including non-regulatory measures. We have considered a range of policy instruments aimed at addressing the problem and meeting our policy objectives and conducted a high-level qualitative assessment of these options. A more thorough cost-benefit analysis of the most promising option was then conducted.

High level qualitative assessment of options and themes

Parallel Trade

For parallel trade, the initial options considered for high level qualitative assessment were:

1. **Give HSE the ability to grant permits to authorisation holders that had licenses at the end of 2022 (preferred).** An obligation could be placed on the HSE to issue a permit in relation to any product that had a valid parallel trade permit in place on 31 December 2022, subject to an assessment of whether the reference product had been withdrawn. This would reduce the complexity of having to list/detail all of the individual products. Could give authorisation holders the opportunity to 'apply' to the HSE again should they wish to introduce the product to market after Dec 2023.
2. **Place the names of products on the face of secondary legislation (time limited).** This option would entail detailing the list of products that had an authorisation at the end of 2022. Drafting for this option would be very technical and would likely require a detailed description of each product with the requisite conditions of use attached but could be theoretically doable. Careful consideration should be given to ensure maximum flexibility is bestowed to the HSE to withdraw products should they see fit.
3. **Global parallel trade scheme.** This option would involve opening a GB parallel permit scheme to all countries. The key difficulty here would be demonstrating identity of products. One approach might be to build a list of countries where exchange of information has proved possible based on applications received. In this scenario applicants can make an application for a parallel trade permit from any country with a regulatory authority, and UK regulatory authority contacts them seeking the necessary information to confirm identity. If the information is provided, that country can be added to the list. This would be a time-consuming process meaning that the scheme could not be set up in time for next growing season and, therefore, would fall short of a key policy objective. It would also involve significant resource on HSE.
4. **Use free trade agreements to allow the import of parallel products.** This would involve bilateral engagement to establish arrangements in existing FTA negotiations to allow the import of parallel products. This process would still require demonstration of identity which could be more difficult from non-EU countries where regulatory regimes are significantly different from GB. Further, as EU countries would be outside the scope of these agreements, it is likely that a more limited range of products would be available for parallel import relative to the EU scheme. Finally, arrangement would not be set up in time for next growing season and, therefore, would fall short of a key policy objective.
5. **Information campaign (non-reg)** to encourage growers to grow crops without treatment where supply and price issues arise but use integrated pest management (IPM) methods to mitigate potential crop losses. This would involve extensive communication with farmers and growers and would take up a large amount of resource and time. Given the amount of time and resource required, it would take a prolonged period of time for the methods to be implemented, meaning there would likely be significant crop losses and/or farmers turning to other crops. Farmers may

be resistant to such an approach from government. There is also no guarantee that economically viable IPM alternatives exist.

Option	Alleviates price and supply issues.	Risks to the environment and human health	Implementation in time	Public sector cost
Give HSE the ability to grant permits	√√√	√√	√√√	√√
Allow import of specific products	√√	√√	√	√√
Global parallel trade scheme	√√	√	X	√
Use free trade agreements	√	√√	X	√√
Information campaign	√	√√√	√	√√

Table 1: Qualitative assessment of longlist options

Scoring	Description
X	No alignment with success factor
√	Low likelihood of meeting the success factor
√√	Medium likelihood of meeting the success factor
√√√	Strong likelihood of meeting the success factor

Table 2: Scoring system

After scoring against the success factors, we deemed that the most likely option to meet the success factors was Option 1, '**Giving HSE the ability to grant permits to authorisation holders that had licenses at the end of 2022**'. Therefore, alongside the information campaign (non-regulatory option), we took forward Option 1 to the shortlist and assessed two variations: a 2-year extension of powers and a 5-year extension. The other options were not taken forward mainly due to their inability to deliver in time for the spring sowing season. They also fell short against some of the other success factors.

Treated Seeds

For treated seeds, the initial options considered for high level qualitative assessment were:

1. **Grant an extension to allow for the import of treated seeds (preferred)** to mitigate the reduction in availability (time limited) by end of Dec 23. This would involve laying legislation before the end of December this year, with assurances being made to farmers that they will be able to plant within the window of opportunity to do so.
2. **IPM information campaign (non-reg)** to encourage growers to continue planting maize (and other veg crop) seeds in spring 2024 without treatment but use IPM methods to mitigate potential crop losses. This would involve compiling or developing a set of effective and feasible IPM techniques for controlling the relevant pests and diseases in each of the affected crops and designing a communications strategy to encourage uptake of the recommended approaches

amongst growers. This depends upon the existence, practicality and affordability of effective IPM methods.

3. **Alternative crops campaign (non-reg)** to encourage growers to transition cultivating alternative crops in spring 2024, and customers to utilise alternative crops as food and fodder before domestic maize supplies run short in late 2024. This would involve devising a set of viable alternative approaches for businesses in each affected sector and designing a communications strategy to encourage uptake of the recommended approaches. This includes encouraging anaerobic digestion plants to make use of other crops and dairy and red meat farmers to transition to alternative methods of feeding livestock, such as rotational grazing. Its success would depend on the existence, practicality and affordability of effective alternative cropping.

Option	Alleviates supply issues.	Risks to the environment and human health	Implementation in time	Public sector cost
Grant an extension	✓✓✓	✓✓	✓✓✓	✓✓✓
IPM Information campaign	✓	✓✓✓	X	✓✓
Alternative crops campaign	✓	✓✓	✓	✓✓

Table 3: Qualitative assessment of longlist options

After scoring against the success factors, we deemed that the most likely option to meet the success factors was Option 1, '**Grant an extension to allow for the import of treated seeds**'. We took forward this option to the shortlist and assessed two variations: a 3.5-year extension of powers and a 5-year extension. A combination of Options 2 & 3 was also carried forward as a non-regulatory option despite scoring poorly against some of the success factors.

Shortlist Options

Based on the qualitative assessment of the longlist of potential policy options, we considered two regulatory options and one non-regulatory option that aim to deliver the policy objectives. In the cost-benefit analysis, we only assess the preferred option as the other options do not sufficiently meet the policy objectives.

A summary of each of the options is laid out below:

Table 1: Outline of shortlisted policy options

Option	Description
Baseline	No government intervention and transition arrangements for parallel trade and treated seeds end by December 2023.
Option 1 (preferred)	Reintroduction / extension of transitional arrangements for parallel trade and treated seeds for 2 and 3.5 years, respectively
Option 2	Reintroduction / extension of transitional arrangements for parallel trade and treated seeds for 5 years
Option 3 (non-reg)	Concerted communication campaigns that would encourage farmers and growers to employ an increased number of integrated pest management techniques to reduce reliance upon pesticide products

Baseline

Parallel Trade

While the UK was an EU Member State, plant protection product suppliers could apply for Parallel Trade Permits (PTP) to import PPPs that were not authorised in GB if they were identical in composition to GB-authorised products. The parallel trade permit provisions did not require an applicant to provide evidence to prove that the product is safe and efficacious. As a result, the parallel trade permit procedure was cheaper, quicker and simpler than for a normal plant protection product authorisation.

Parallel permits in GB were used to take advantage of price differentials set by manufacturers between EU countries and GB. As a result, parallel products tended to be cheaper than the equivalent reference product in the GB market. This reduced cost for buyers of PPPs and could potentially have plugged gaps in supply during unseasonal demand, although the extent to which this happened is uncertain.

Transitional arrangements were put in place after EU Exit to continue to allow parallel permits to remain valid until the end of 2022. The sale of pesticide products (PPPs) imported via parallel permits was allowed until June 2023 and the use of existing stocks until the end of June 2024. This means that the import and sale of parallel products has now come to an end in GB.

As a result, in the baseline, parallel products could not be sold in GB and could only be used for the first 6 months of the assessment period. This is likely to lead to price rises in some areas of the market and a potential risk of supply gaps. We expect price rises to arise in two forms in the baseline. Firstly, where PPP users have to switch from parallel products to the more expensive reference products. Stakeholder evidence suggests an average historic price differential between parallel and reference products of ~18%. Secondly, PPP users may face even higher prices for reference products due to price gouging in the absence of parallel product competition. Evidence on extent to which this would happen is mixed and we have provided indicative estimates in the *Potential price rises from removal of parallel competition (unmonetised)* section.

We have limited evidence to estimate the current impact of the end of parallel sales on inventory levels. However, as the sale of existing stock only expired 2 months ago, it's likely that any changes would be minor at this stage. Looking forward, manufacturers have expressed confidence that the gap left by parallels could be met and that they plan to increase production volumes accordingly. Although this claim may be reasonable where GB products would replace predictable (longer-term) supply of parallel products, it's unlikely that manufacturers would be able to adapt to meet short-term spikes in demand that may previously have been met by parallel imports¹.

In terms of scale, we estimate that 3.5% of the pesticide market is supplied by parallel products at a value of £22m². Our analysis suggests that there were 51 parallel products on the GB register that have left only 1 competitor firm (the seller of the reference product) in the same pest control 'space'. In total, we estimate that the active substances associated with these products treat up to £4bn worth of crops in GB each year³.

Treated seeds

Approval of pesticide product authorisations in the EU is done at a Member State level. This is because different climatic and environmental conditions can impact how a pesticide acts on its environment, making it potentially pose a higher environmental risk in some countries than others. The arrangement to allow treated seed products to be used in any Member State was established as a pragmatic solution to difficulties in enforcing movement of seed treatments.

When GB left the EU, access to several seed treatments that were authorised in other Member States but not in GB would have become unavailable for use in GB. As these seed treatments were important to crop production, transitional arrangements were established to extend the arrangements. These post EU-exit transitional arrangements enabled seeds treated with pesticide products authorised for use in at least one EU member state to continue to be imported, marketed and used in GB up until 31 December

¹ This is because manufacturers typically plan production 18-24 months before sale.

² Total market size = £814m, 2021 estimate, IHS PPP Sector Market Value UK, conversion to GB was then applied.

³ Note that this is likely to be an overestimate of the value of crops treated by the 'low competition' products themselves as other products will use the same active substances.

2023. These arrangements did not apply to products that would attain a Member State authorisation after EU-Exit.

When this extension ends at the end of this year, many of the same seed treatments will be unavailable to growers as they still do not have GB product authorisations.

Therefore, in the baseline, from January 2024 GB growers will lose access to several key seed treatments. This will impact their ability to control certain pests and diseases on some crops, which in turn will affect good crop establishment and potentially yield. In *Annex 2 – List of key seed treatments not authorised for use in GB*, we set out a list, provided by stakeholders, of the most significant treatments that would be lost.

Option 1 (preferred option)

Parallel Trade

This option would give the regulator, HSE, the ability to grant new parallel trade permits for 2 years (or until the GB reference product authorisation expires) which replicate those that were previously issued and valid at the end of 2022, to allow continued parallel trade on the specified products contained within them. HSE would also have the ability to grant grace periods when the permits expire for the sale in GB for a further 6 months and the use of stocks for a further 18 months (including the 6 months of sale).

We would not be allowing applications from anyone/any company who was not a valid permit holder at the end of the previous scheme (on 31st December 2022). Permits would only be issued for those previous parallel trade products that are still authorised and on the market in an EU Member State and that continue to have a reference product still authorised in GB.

HSE will raise awareness of the application process through existing communications channels and online guidance. HSE advise that **330- 350 applications** would be made based on GB applications mirroring those made in Northern Ireland at EU-Exit and subtracting products that are no longer available for trade into GB. Whilst the numbers will be fluid (e.g., active substances will expire in the EU meaning that products will not be available for import into GB; permit holders may no longer exist as a legal entity) if the fees to industry are waived and there is no cost to them in applying, it is reasonable to assume that all who can take advantage will do so.

This option gives time for manufacturers to apply for a greater range of authorisations to increase competition in the market in the medium term and gives time for reductions in farm input costs to materialise which are putting extreme pressure on margins of farmers.

Treated seeds

This option would grant a 3.5-year extension to the current treated seeds transitional arrangement which currently finishes at the end of December 2023.

This measure would allow seeds treated with pesticide products authorised for use in at least one EU member state to be imported, marketed and used in GB up until 31 June 2027. These arrangements would again not apply to products that attained a Member State authorisation after EU-Exit and would automatically cease on the date on which the pesticide used to treat the seeds is no longer authorised for that use in at least one Member State.

Although some seed treatments have been withdrawn in the EU since EU-Exit, this option would give GB growers access to roughly the same group of seed treatments available during the transition. In other words, we would consider this option to be maintaining the current arrangements for the period of the extension.

The suggested time period of 3.5 years has been chosen to give further opportunity for industry and growers to find alternative solutions to crop protection (through development of integrated pest management techniques or for industry to seek authorisations of products within GB market). This would reduce reliance on products only currently authorised within the EU. The scheme will end in June rather than December as maize seeds are typically ordered in autumn and sown in spring.

Note that applications for emergency authorisation of seed treatments could be applied for and granted during the legislative process of this SI but would only provide a solution of up to 120 days. The SI would provide a longer-term solution beyond the 2024 growing season.

Implementation and Enforcement

This option would be implemented using secondary legislation under REUL act powers.

The requirements for supply and use of seed treatments and parallel permits are set out in Regulation (EC) No 1107/2009 and Regulation (EU) 2027/625, enforced using powers under the Plant Protection Products 2011 Regulations and the Official Controls (Plant Protection Products) Regulations 2020 respectively; and the Plant Protection Products (Sustainable Use) Regulations 2012.

HSE and Local Authorities use both intelligence-led investigation and a broad range of controls including the annual formulation survey as a way of monitoring and identifying any products that do not meet regulatory standards. This is in line with current enforcement practice and will remain in operation for the timeline of the policy. Parallel trade products will continue to be in scope for being selected for the annual formulation survey for the duration of the permits. Local Authorities may investigate where there are reports - often via intelligence from manufacturers - that products are not identical to the GB reference product. It should be noted that these methods are likely not sufficient to identify and enforce against all non-compliance events.

Option 2

This option is the same as option 1 except that the arrangements would be for 5 years for both treated seeds and parallel trade, with a 1-year grace period to allow use of parallel products.

We have not conducted an in-depth cost-benefit analysis of this option as it does not sufficiently meet the policy objectives. This is predominantly because the longer period increases safety and environmental risks for treated seeds given that HSE would not be able to check that the product formulations in the country of origin are the same as those authorised in the UK post EU Exit.

Option 3

This option would entail working with farmers and growers to employ further integrated pest management techniques to reduce their reliance on PPPs.

We have not conducted an in-depth cost-benefit analysis of this option as it does not sufficiently meet the policy objectives in the time available. This is predominantly because it would require a significant amount of resource from Defra to carry out such a large campaign to reach so many farmers and growers. Moreover, even if all users were to employ IPM measures instead of using the PPPs within scope, it would take a number of years to prepare for such changes and their yields would not necessarily return to the same level.

Monetised and non-monetised costs and benefits of each option (including administrative burden)

Summary Figures

A summary of the costs and benefits of the preferred option is set out below. Note that indirect impacts are included in these figures and discounting is applied. The figures are arranged as 'low / central / high' to reflect the 5% / 50% / 95% confidence bounds of the total net present value (NPV) – see High / Low Analysis.

Also note that the figures here do not match with those in the summary pages. This is because these figures are in 2023 prices and discounted to a 2024 base year whereas the other figures are in 2019 prices with a 2020 base year, as required by RPC guidelines. The figures quoted in this table are

explained in detail in the *Costs and benefits of parallel trade* and *Costs and benefits of seed treatments* sections below.

Table 2: Summary estimates of monetised costs and benefits of the preferred option relative to the baseline. Price year = 2023, Base year = 2024, discounting applied at 3.5%.

	Average net annual impact, 2024-2028, Low/Central/High (£m)	Total net impact, 2024-2028, Low/Central/High (£m)
Treated Seeds		
A: Anaerobic Digestion	113 / 175 / 195	451 / 700 / 779
B: Dairy Farms	44 / 43 / 41	176 / 172 / 165
C: Beef Farms	0 / 2 / 3	2 / 8 / 10
D: Arable Maize Growers	14 / 12 / 12	54 / 49 / 50
E: Familiarisation	-1 / 0 / 0	-.3 / -.2 / -.1
NPV = A+B+C+D+E	NA	683 / 929 / 1004
Parallel Trade		
F: Parallel Importer	1.2 / 1 / .7	4.9 / 4.1 / 2.7
G: Manufacturer	-3.7 / -3.2 / -2.2	-14.9 / -13 / -8.7
H: Farmer	1.9 / 2.3 / 1.5	7.4 / 9.3 / 6.2
I: Amenity	.1 / .1 / .1	.3 / .3 / .2
J: Familiarisation	0 / 0 / 0	-.1 / -.1 / 0
K: Public sector	0 / 0 / 0	-.2 / -.2 / -.2
NPV = F+G+H+I+J+K	NA	-2.3 / .6 / .4
Total		
Benefits = A+B+C+D+F+H+I	174 / 236 / 253	696 / 942 / 1013
Costs = E+G+J+K	4 / 3 / 2	15 / 13 / 9
NPV = Benefits – Costs	NA	681 / 929 / 1004

To be clear, these figures reflect the policy's impact considered against a 'do nothing' counterfactual only, rather than against the status quo. Assessing the policy against the status quo would lead to minimal impacts, as the preferred option reflects continuity of existing arrangements already in place (or recently expired) and any familiarisation costs for businesses would be minimal.

Note that the impacts for some groups will not consistently rise from low – central – high. This is because the high and low values are based on a Monte-Carlo simulation where the values of the inputs are randomised across many simulations and, therefore, the value of some inputs at the chosen NPV percentiles may lead to counterintuitive results when looking at individual impacts.

And the following impacts were identified but not monetised:

Non-monetised impacts	Reason for not monetising
Impact of price rises for GB reference products	Not monetised due to high uncertainty around the degree to which prices could rise in the absence of competition from parallel trade. This is an indirect impact and a qualitative assessment is explored in the Wider Impacts section.
Environmental & Human Health impact	Not monetised due to insufficient data enabling a monetisation of the potential impacts to human health and the environment from the proposed measures. In addition, there is high uncertainty as to how the measures will impact human health and the environment. This is discussed qualitatively in the sections below.

Consumer price rises	Not monetised due to high uncertainty as to the extent to which cost savings in the agricultural, energy, and amenity sector would feed through to consumer prices. This is considered an indirect impact, so we have not taken further action to monetise these impacts but is explored in the Wider impacts section.
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Costs and benefits of parallel trade

Description of impacts

First order

The legislation enacted in the preferred option would confer a power on the GB regulator (HSE) to grant permits to holders of parallel permits as of 31st December 2022. Evidence from HSE suggests that 330-350 eligible permits would receive reapplication. This would mean that parallel importers will potentially have the opportunity to import 330-350 different products from EU countries into GB from early 2024 to early 2026 (and sell until mid-2026) that they would not be able to in the baseline.

Parallel importers operate opportunistically, taking advantage of excess supply and price differentials between identical products in EU countries and GB that can change over time. This means that we would only expect parallel imports to come into the market where there is a sufficient difference in price between a product sold in GB and an EU Member State (and sufficient excess supply in the Member State) for parallel importers to make a profit.

Parallel products and their reference products⁴ are considered near-perfect substitutes due to their equivalent composition and we therefore assume that most buyers of reference products (and similar alternatives) in the baseline would automatically switch to the cheaper parallel products in the intervention. Parallel importers would thereby sell more than in the baseline and manufacturers and distributors of non-parallel products would sell less and buyers would spend less for the same product.

We consider these effects as direct because they follow automatically from the introduction of the measure and are not dependent upon further action. In particular, we consider buyers' switch to the cheaper product as 'automatic' as they do not change their buying behaviour (choosing whatever product is cheaper).

We are also aware that some parts of the market compete on non-price factors (such as provision of advice) which means that substitution to cheaper products would not always happen. This is reflected in our figures as our calculation uses the historic value of parallel imports sold in the market which thereby accounts for buyers not switching to parallel products due to non-price factors.

An alternative route through which parallel products could enter the market is to meet supply gaps in GB that would not be met in the baseline. PPPs are manufactured to forecasts agreed with manufacturers 18 – 24 months ahead of the season of use. This means that, where seasonal demand differs from manufacturers predictions, shortfalls in supply could arise in the baseline.

If the appropriate parallel product was available and could be imported into GB within the required timeframe (this is uncertain and explored further below), then parallel importers would supply the GB market to fill the supply gap. As GB buyers of the reference product would have bought the GB reference product if it were available, then we would expect that they would automatically switch to buy the parallel product instead⁵.

This would result in parallel importers selling more than in the baseline and buyers gaining utility from buying product not available in the baseline. We consider that these are also direct impacts as they follow automatically from the introduction of the measure and are not dependent upon further action. Again, buyers' switch to buy the newly available product is 'automatic' as they would have bought the product if it were available in the baseline.

In summary, we predict the following **first-order, direct impacts** from the reintroduction of parallel trade:

⁴ The equivalent product authorised in GB against which the parallel permit is authorised

⁵ We do not interpret this as a change in behaviour that could constitute a demand curve shift

- Parallel importers gain profit from selling more parallel PPPs than in the baseline
- Manufacturers & distributors of non-parallel PPPs lose profit equal to what would've been sold in the absence of parallel PPPs
- Farmers gain avoided cost from paying lower prices for parallel PPPs (the price difference between parallel and GB reference PPPs) and gain avoided profit loss from supply gaps being met relative to baseline (based on avoided yield loss from not having access to the missing PPPs).
- Amenity users gain avoided cost from paying lower price for parallel PPPs (the price difference between parallel and GB reference PPPs) and gain avoided profit loss from supply gaps being met relative to baseline (based on avoided 'utility' loss from not having access to the missing PPPs).

Second order

Once these parallel products have entered the market, it's possible that manufacturers and distributors of non-parallel products would adjust prices down (or not increase them as planned) due to increased competition from parallels relative to the baseline.

In theory, removing parallel products (and the 'threat' of parallel products that have permits but are not used) reduces the level of competition in the market, giving manufacturers of alternative products incentive to increase prices in areas of low competition to maximise profit. The evidence on the extent to which this might happen in the baseline is mixed – we set out a more detailed assessment in *Potential price rises from removal of parallel competition (unmonetised)*.

As the price change depends on a change in pricing behaviour from incumbent suppliers in response to parallels coming onto the market, we interpret the impacts of these potential price increases as **second order and indirect**, as follows:

- Manufacturers & distributors of non-parallel PPPs lose profit equivalent to that made due to price rises in baseline
- Farmers gain avoided cost from not paying for price rises relative to baseline
- Amenity users gain avoided cost from not paying for price rises relative to baseline

Third order

Finally, once parallel products have entered the market and price changes have occurred, we would expect the avoided additional costs to be passed onto consumers in the form of lower food and amenity prices. As these changes result from 'pass-through'⁶, we interpret the impacts of this as **third order and indirect**:

- Consumer prices fall as cost saving to farmers gets passed on in food and amenity prices

Explanation of calculations

We estimate that these changes will lead to the following impacts on the following groups. The calculations and rationale behind these calculations are explained in each subsection:

Gain in profit to distributors of parallel products (a.k.a. parallel importers) (F)

We expect companies that distribute imported parallel products to gain revenue equal to the value of parallel products that they sell into the market.

We estimate that £22m worth of parallel imports are sold into the GB market each year (3.5% of the market⁷) with a profit margin to parallel importers of 7.5%⁸. Therefore, if parallel imports were

⁶ [RPC case histories - direct and indirect impacts March 2019 1 .pdf \(publishing.service.gov.uk\)](#)

⁷ Source: stakeholder input.

⁸ Source: proxy used based on the median profit margin associated with sale of 'generic products'. This was provided from stakeholders

reintroduced, we assume that companies that distribute parallel products would gain by £1.7m per year relative to the baseline.

As the proposal would enable parallel products to be sold for 2.5 more years relative to the baseline (starting in Jan 2024), we assume this profit gain would occur until end of June 2026⁹, to a discounted total of £4.1m. This implies that parallel importers would not gain in the final 12 months (when parallel PPPs could be used but not sold) as they would not be able to import or sell parallel products in this time.

Loss in profit to GB manufacturers and non-parallel distributors (G)

We estimate that manufacturers and non-parallel distributors will lose the value of profit that they would've made in the absence of parallel products in the baseline.

We calculate this by multiplying the value of the parallel products above by an assumed 18% price differential between parallel products and their reference products and by an assumed 20% average profit margin¹⁰. Therefore, if parallel imports were reintroduced, we assume that manufacturers and non-parallel distributors would lose by £5.3m per year relative to the baseline.

Again, as the proposal would enable parallel products to be sold for 2.5 more years relative to the baseline (starting in Jan 2024), we assume this profit loss would occur until end of June 2026¹¹, to a discounted total of £13m. This implies that manufacturers and non-parallel distributors would not lose in the final 12 months (when parallel PPPs could be used but not sold).

Note that we do not estimate the impacts of any change in pricing strategy for alternatives to parallel PPPs in the baseline due to high uncertainty around the extent to which this might happen and because we deem this to be an indirect impact. We discuss this further in the Wider impacts section.

We also do not incorporate potential supply gaps into this analysis due to data limitations. We believe that the lack of monetisation is proportional to the requirements of the analysis as, based on conversations with stakeholders, the probability of a supply gap occurring and being met by parallel imports is likely to be very low¹² which would lead to a negligible impact on the profit loss calculated above.

Gain in profit to farmers (H)

We expect farmers to be positively impacted by the proposed reintroduction of parallel permits as they will avoid paying higher prices for PPP products relative to the baseline.

We calculate this by multiplying the proportion of the value of the parallel products above that is used in agriculture (96%¹³ of £22m) by an assumed 18% price differential between parallel products and their GB reference products and alternatives. This comes to £3.8m per year relative to the baseline and we assume this benefit materialise for 2.5 years in line with the period when parallel PPPs could be sold. This comes to £9.3m, discounted.

Again, note that we do not estimate the impacts of any change in pricing strategy for alternatives to parallel PPPs in the baseline due to high uncertainty around the extent to which this might happen and because we deem this to be an indirect impact. We discuss this further in the Wider impacts section.

We also do not incorporate potential supply gaps into this analysis due to data limitations. We believe that the lack of monetisation is proportional to the requirements of the analysis as the probability of a supply gap occurring and being met by parallel imports is likely to be very low which would lead to a negligible impact on farmers.

Gain in profit to amenity users (I)

⁹ Note that this assumes that permits and grace periods would be granted by the regulator.

¹⁰ Sources: Price differential established from confidential stakeholder evidence and profit margin is the average of 'generic' and 'patent' profits margins as provided by stakeholders. These profit margins are chosen as indicative of the range of profit made from sale of PPPs. We do not have evidence on what proportion of parallel products are generic vs patent. Note that we assume the margin is higher for non-importers based on stakeholder evidence.

¹¹ Note that this assumes that permits and grace periods would be granted by the regulator.

¹² The reasoning is that parallel imports are usually unable to supply meaningful volumes of product in the time required to fill a demand surge.

¹³ Source: Pesticide Usage Survey

We expect amenity users to be positively impacted by the proposed reintroduction of parallel permits as they will avoid paying higher prices for PPP products in the baseline.

We calculate this by multiplying the proportion of the value of the parallel products above that is used in amenity settings (4% of £22m) by an assumed 18% price differential between parallel products and their GB reference products and alternatives. This comes to £0.1m per year relative to the baseline and we assume this benefit materialise for 2.5 years in line with the period when parallel PPPs could be sold. This comes to £0.3m, discounted.

Again, the impacts of changes in pricing strategy and supply gaps are not estimated for the reasons set out above.

Familiarisation cost (J)

We expect that familiarisation costs would be relatively low as the proposal seeks to maintain the status quo. Subsequently, based on evidence from an HSE survey on the hours spent on finding out about changes to H&S regulation¹⁴, we have assumed that each of the directly impacted groups would incur 2.4 hours' familiarisation at mean wage for the business category. This comes to a one-off cost of £0.1m experienced in the first year of the intervention¹⁵.

This calculation made is familiarisation cost = number of businesses¹⁶ * (mean gross annual wage for business type¹⁷ / working hours per year¹⁸) * 2.4 hours * (1 + non-working labour cost uplift of 20%).

Costs and benefits of seed treatments

Description of impacts

First order

The legislation enacted in the preferred option would enable several treated seed products to be imported that could not be imported in the baseline. The primary impact of this change would be to increase the choice of pesticide products available to the GB market.

Demand for seed treatments and their alternatives in GB is derived from growers who buy pesticides from distributors who then carry out the actual importation and sourcing of the pesticides from manufacturers to meet grower demand. Growers' demand for pesticides is determined by the crops that they have decided to grow which, in turn, depends on which products are available for use (amongst other factors such as weather).

In this way, the extension of EU seed treatment availability shifts demand for pesticides relative to the baseline. Specifically, we would expect that some farmers will decide to grow a different set of crops than they would in the baseline and thereby demand a different set of pesticides and seeds based on their pre-determined decision-making function.

We consider this demand shift (or lack of, relative to the baseline) to be a **direct** consequence of the legislative change because each step in the chain to create the change in demand follows automatically from the legislative change; growers' decision-making process is predetermined, and they simply adjust the parameters in line with the differing pesticide availability.

We estimate that the impact of this demand change on distributors and manufacturers would be neutral. This is because they would still sell substitute goods to growers in the baseline and, as their profit

¹⁴ The HSE omnibus survey. We believe that H&S regulation is applicable to these legislative changes given the strong link between pesticide use and handling and health and safety.

¹⁵ Familiarisation cost = number of businesses * (mean gross annual wage for business type / working hours per year) * 8 hours * (1 + non-working labour cost uplift of 20%).

¹⁶ Manufacture of pesticides and other agrochemical products: TABLE 2

<https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/ukbusinessactivitysizeandlocation>

Wholesale of agricultural machinery, equipment and supplies: TABLE 2

<https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/ukbusinessactivitysizeandlocation>

¹⁷ Manufacture of pesticides and other agrochemical products:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

Wholesale of agricultural machinery, equipment and supplies:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

¹⁸ FTE = 2080 hours per year

margins for these products would be similar¹⁹, make roughly the same amount of profits. We note that some individual businesses may lose / gain more than others.

For growers, we expect the impact to equate to the difference in profits they would make in the baseline versus when treated seeds are available. The crops for which the EU seed treatments would positively impact production are maize (used for cattle feed and in anaerobic digestion) and about 24 minor vegetable crops.

In summary, we predict the following **first-order, direct impacts** from the reintroduction of treated seeds:

- Distributors switch supply from alternatives to treated seeds. They have roughly the same profit margin and volume of sale so no net impact although some distributors may lose / gain more than others.
- Manufacturers switch supply in line with distributor demand. They have roughly the same profit margin and volume of sale so no net impact although some manufacturers may lose / gain more than others.
- Minor veg growers gain profit from growing better yields of veg.
- Arable maize growers (except those below) gain profit from growing maize instead of alternative crops with lower margins.
- 90% dairy & beef farmers gain profit from growing and using maize to feed to cattle (rather than alternatives used in baseline). These dairy / beef farmers grow their own maize.
- 51% of anaerobic digestion producers gain profit from growing and using maize in AD production (rather than alternatives used in baseline). These AD producers grow their own maize.

Second order

We would then expect a second-order impact on users of crops grown by farmers (i.e., 3rd parties). Specifically, as growers would likely produce more maize relative to the baseline, there would be an increased supply of maize in the market which would have the following **second-order, indirect** impacts:

- 49% of anaerobic digestion producers gain profit from buying and using maize in AD production (rather than alternatives used in baseline). These AD producers buy crop from 3rd party farmers.
- 10% dairy & beef farmers gain profit from buying and using maize to feed to cattle (rather than alternatives used in baseline). These farmers buy crop from 3rd party farmers.

Third order

Finally, once the first and second-order impacts have occurred, we would expect the avoided profit loss to be 'passed through' onto consumers in the form of lower food and energy prices. We interpret the impacts of this as **third order and indirect**:

- Consumer prices fall as cost saving to farmers gets passed on in food and energy prices

Explanation of calculations

We estimate that these changes will lead to the following impacts on the following groups. The calculations and rationale behind these calculations are explained in each subsection:

Profit gain to minor veg growers

We have not monetised the impact to minor veg growers due to insufficient data. There are around 24 vegetable crops whose production could be improved relative to the baseline with access to fungicide seed treatments from the EU. Many of the vegetable crops are so minor that data is not readily available, and of the crops for which data is available, the average estimated annual area grown in the UK is

¹⁹ As indicated in conversations with stakeholders.

around 4,700 hectares, 0.1% of total cropable area in the UK. We do not believe that the exclusion of this impact will have a significant effect on the assessment of the policy.

Profit gain to cattle farms that grow their own fodder (B+C)

In the intervention, we estimate that 124,000 ha of maize would be grown by dairy (118,000 ha) and beef farms (6,000 ha) that feed home-grown fodder crops to their cattle. This is based on the area grown by these farms in 2023 when EU seed treatments were still available.

In the baseline, in the absence of seed treatments, we assume that cattle farmers will choose to grow the next best alternative which we estimate to be wholecrop cereals (on average, £50 per ha more expensive to grow than maize²⁰). This has a lower energy content than maize per hectare so, in line with stakeholder advice, we assume farmers will substitute the lost energy with purchased feed concentrate at £0.03 per MJ²¹.

Applying across the area of maize grown on-farm for cattle feed, we estimate that switching to wholecrop + concentrates would increase the cost of maintaining status quo production by £45m per year (Dairy=£43m, Beef=£2m), broken down by £7m (Dairy=£6.8m, Beef=£0.3m), in higher cropping costs and £38m (Dairy=£36m, Beef=£2m), in concentrates cost.

Therefore, relative to the baseline, cattle farms using homegrown maize increase profits by £45m for each year of the 4 years of the intervention. This comes to £162.4m for dairy farms and £8m for beef farms, once discounting has been applied.

Profit gain to anaerobic digestion plants that grow their own crops (A)

In the intervention, we estimate that 38,000 ha of maize would be grown by anaerobic digestion businesses that use 'home-grown' crops in production²². This is based on the area grown by these businesses in 2023 when EU seed treatments were still available.

In the baseline, in the absence of seed treatments, we assume that the area currently grown for AD maize switches in the first year to spring barley (50%), grass ley (25%) and unprotected maize (25%), where maize yields fall by 40%. In the subsequent years, with more time to plan, we assume that the area currently grown for AD maize switches to winter wheat (75%) and grass ley (25%) with no maize grown. As this mix is less productive, to maintain status quo gas output, we assume anaerobic digester producers would buy in cereal grains to supplement the mix. Finally, we assume that the suboptimal crop mix leads to a 15% fall in total revenue in year 1 and 10% fall in year 2 onwards. These assumptions are based on evidence provided by stakeholders.

Applying across the portion of the AD sector in GB using homegrown feed, we estimate a ~£106m gain per year in avoided production cost increases from the availability of treated seeds. This number reflects the undiscounted average annual impact across the 4 years of the intervention. This comes to £403m across the intervention period with discounting applied.

Profit gain to arable maize growers (D)

We assume that the remaining maize area in the intervention is grown by arable growers that sell the crop onto cattle farms and anaerobic digestion plants that do not grow their own crops. We estimate that these arable farms grow 26% of maize by area in GB²³.

In the baseline, we assume that these arable farms would choose to grow a combination of rye, grass, and wholecrop cereals in the absence of seed treatments. This is based on the demand from cattle farmers and anaerobic digestion businesses, in line with the assumptions in the sections above. We estimate that these crops would generate a profit of ~£33m in year 1 and ~£42m in year 2 onwards.

In the intervention, we assume that the arable farms instead grow maize. This generates £56m worth of profit each year. Therefore, we estimate the profit gain in the intervention relative to the baseline to equal

²⁰ Source: Kite Consulting

²¹ Assuming £320 per tonne concentrate, 0.45 kg concentrate required per kg milk, and 5.3 MJ energy per litre milk.

²² Source: Proportion of maize area grown for AD = 34% (provided by stakeholders) and the proportion of this that is grown on sites owned by AD businesses is 51% taken from:

[FIGURE 11: AD and Composting Market Survey Report FINAL WRA-009-19 \(wrap.org.uk\)](#)

²³ Source: The remainder of maize area once that grown by AD and cattle farms is subtracted.

£23m in year 1 and £15m for year 2 onwards. In total across the intervention, this comes to £6.5m for maize grown for cattle and £42.7m for anaerobic digestion with discounting applied.

Profit gain to cattle farms that buy crops from 3rd parties (indirect) (B+C)

We assume that 14,000 hectares of maize crops grown by arable farmers in the intervention would be used by cattle farmers (Dairy=13,000, Beef=1,000) in place of the alternative crops grown and concentrates used in the baseline²⁴.

Here we assume the same profit gain calculation as for home-grown fodder farms but applied to the smaller area (Dairy=£4.0m, Beef=£0.2m) and subtracting the price change between buying maize vs alternatives (Dairy=£1.6m, Beef=£0.1m). This comes to a small increase of £2.5m in profits per year relative to the baseline (Dairy=£2.4m, Beef=£0.1m), and we would expect this number to fluctuate depending on the relative price difference between concentrates and the price of fodder crops which can change each season. This comes to £9.2m for dairy farms and £0.4m for beef farms discounted across the intervention.

Profit gain to anaerobic digestion businesses that buy crops from 3rd parties (indirect) (A)

We assume that the remaining maize crops grown by arable farmers in the intervention would be used by anaerobic digestion businesses in place of the alternative crops used in the baseline.

Here we assume the same profit gain calculation as for anaerobic digestion plants using home-grown crops but applied to the larger area and subtracting the price change between buying maize vs alternatives. This comes to a £101m increase in profits in year 1 and a £70m increase from year 2 onwards, relative to the baseline. In total, across the intervention, this comes to £296.5m with discounting applied.

Familiarisation cost (E)

We expect that familiarisation costs would be relatively low as the proposal seeks to maintain the status quo. Subsequently, based on evidence from an HSE survey on the hours spent on finding out about changes to H&S regulation²⁵, we have assumed that each of the directly impacted groups would incur 2.4 hours' familiarisation at mean wage for the business category. This comes to a one-off cost of £0.2m experienced in the first year of the intervention.

This calculation made is familiarisation cost = number of businesses²⁶ * (mean gross annual wage for business type²⁷ / working hours per year²⁸) * 2.4 hours * (1 + non-working labour cost uplift of 20%).

Direct costs and benefits to business calculations

We estimate that direct benefits to businesses are an increase in profits for farmers, parallel importers, anaerobic digestion companies, and amenity users, while the costs to manufacturers and distributors of non-parallel products associated with the proposed options is the main cost included in the figures below.

The first table shows the present value (discounted) costs and benefits associated with each impacted group in 2023 prices and 2024 base year. This is consistent with the explanation of calculations above and the figures in table 2. The letters before each row correspond to the letters in the rows in table 2 and

²⁴ Source: Inverse of the 'home-grown' proportion of cattle used above.

²⁵ The HSE omnibus survey. We believe that H&S regulation is applicable to these legislative changes given the strong link between pesticide use and handling and health and safety.

²⁶ AD businesses from

[AD and Composting Market Survey Report FINAL WRA-009-19 \(wrap.org.uk\)](https://www.wrap.org.uk/wrap-reports/ad-and-composting-market-survey-report-final-wra-009-19)

Farms based on proportion of the total number of cropping farms in UK (June Survey of Agriculture) according to the area of maize grown by cattle farmers as estimated from stakeholder assumptions compared to total croppable area in UK.

Treated seed distributors are assumed equivalent to *Wholesale of grain, unmanufactured tobacco, seeds and animal feeds* from:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

²⁷ AD businesses = Manufacture of gas; distribution of gaseous fuels through mains:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

Farms = Growing of cereals (except rice), leguminous crops and oil seeds: <https://www.ons.gov.uk/employmentandlabourmarket/p>

Treated seed distributors = Wholesale of grain, unmanufactured tobacco, seeds and animal feeds:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

²⁸ FTE = 2080 hours per year

in the calculation explanations in the section above. The 'average annual PV cost / benefit' column represents the total discounted costs / benefit divided over the implementation period (4 years):

Table 3: Costs and benefits broken down by impacted group, 2023 prices, 2024 base year

Impacted group	PV Cost (£m)	PV Benefit (£m)	Average Annual PV Cost / Benefit (£m)	Direct?	Business?
Treated seeds					
A: Anaerobic Digestion Homegrown		403.0	100.7	Yes	Yes
A: Anaerobic Digestion 3rd Party		296.5	74.1	No	Yes
B: Dairy Farms Homegrown		162.4	40.6	Yes	Yes
C: Beef Farms Homegrown		8.0	2.0	Yes	Yes
B: Dairy Farms 3rd Party		9.2	2.3	No	Yes
C: Beef Farms 3rd Party		0.4	0.1	No	Yes
D: Arable Maize Growers (cattle)		6.5	1.6	Yes	Yes
D: Arable Maize Growers (AD)		42.7	10.7	Yes	Yes
E: Treated Seed Familiarisation	0.2		0.0	Yes	Yes
Parallel trade					
F: Parallel Importer		4.1	1.0	Yes	Yes
G: Manufacturer & distributor of non-parallel PPPs	13.0		3.2	Yes	Yes
H: Farmers (parallel)		9.3	2.3	Yes	Yes
I: Amenity (parallel)		0.3	0.1	Yes	Yes
J: Parallel Trade Familiarisation	0.1		0.0	Yes	Yes
K: Public sector cost	0.2		0.0	Yes	No
Total					
Total direct business	13.2	636.3	155.8		
Total business	13.2	942.4	232.3		
Total all	13.4	942.4	232.3		

The figures below have been adjusted to 2019 prices and the base year converted to 2020 so that the policy options can be compared to other policies using consistent pricing and discounting. This explains any difference to the costs and benefits outlined in the earlier sections. These are the figures used in the summary pages.

Table 4: Costs and benefits broken down by impacted group, 2019 prices, 2020 base year

Impacted group	PV Cost (£m)	PV Benefit (£m)	Average Annual PV Cost / Benefit (£m)	Direct?	Business?
Treated seeds					
A: Anaerobic Digestion Homegrown		305.6	76.4	Yes	Yes
A: Anaerobic Digestion 3rd Party		224.9	56.2	No	Yes
B: Dairy Farms Homegrown		123.2	30.8	Yes	Yes
C: Beef Farms Homegrown		6.1	1.5	Yes	Yes
B: Dairy Farms 3rd Party		7.0	1.7	No	Yes
C: Beef Farms 3rd Party		0.3	0.1	No	Yes

D: Arable Maize Growers (cattle)		4.9	1.2	Yes	Yes
D: Arable Maize Growers (AD)		32.4	8.1	Yes	Yes
E: Treated Seed Familiarisation	0.1		0.0	Yes	Yes
Parallel trade					
F: Parallel Importer		3.1	0.8	Yes	Yes
G: Manufacturer & distributor of non-parallel PPPs	9.8		2.5	Yes	Yes
H: Farmers (parallel)		7.0	1.8	Yes	Yes
I: Amenity (parallel)		0.3	0.1	Yes	Yes
J: Parallel Trade Familiarisation	0.1		0.0	Yes	Yes
K: Public sector cost	0.1		0.0	Yes	No
Total					
Total direct business	10.0	482.5	118.1		
Total business	10.0	714.7	176.2		
Total all	10.2	714.7	176.1		

Table 5: Direct costs and benefits to businesses, 2019 prices, 2020 base year

	Net direct cost to business per year (£m)	Business Net Present Value (£m)	BIT Score
Option 1	-124.3	704.7	-497.2

Risks, assumptions, and sensitivity

Assumptions and key evidence sources

There are a number of key assumptions and evidence sources that sit behind this IA and analysis. These are set out below:

Parallel Trade

- Profit margins for pesticides.** We received evidence from stakeholders on the range of profit margins that are usually derived from 'on patent' and 'generic' products. We used the median of the range (20%) to determine the profit margin for non-parallel products. We believe that this estimate is the most appropriate given the available evidence, however, due to the limited scope of the data, it's possible that this number is not representative. We explore this in the sensitivity analysis. Evidence suggests that margins for parallel importers are much tighter. For this reason, we assumed a 7.5% profit margin for parallel importers, based on the median of the range for 'generic' products. Again, we believe that this was a reasonable proxy given the evidence available.
- Price differential between parallel and non-parallel products.** We estimated a 18% price differential based on the average difference in sales price of a select group of products between a subset of EU member states and GB. The main limitation of this approach is that it does not account for logistical costs and margins taken by parallel importers to get the parallel product to the GB market. Therefore, the 18% may be an overestimate. In addition, due to the limited scope of the data underpinning the estimate, there is uncertainty as to whether this price differential is representative across all products. We explore this uncertainty in the sensitivity analysis section below.
- Parallel trade proportion of the market.** We assume that 3.5% of the GB pesticide market is supplied by parallel imports in the baseline. This is based on evidence from stakeholders of

historic levels of parallel products sold in GB. A range of 1% and 5% was found and we therefore consider these the lower and upper bounds of fluctuation from year to year.

4. **Supply gaps.** We do not monetise the potential impact of supply gaps in the analysis. This is done due to a lack of evidence to indicate the probability of a parallel import meeting a supply gap in the baseline that could not be met by GB authorised products. Although we do not have specific estimates, anecdotal evidence from stakeholders suggests that the probability of this happening is low and, therefore, the lack of monetisation has limited impact on the overall assessment.
5. **Familiarisation cost.** We expect that familiarisation costs would be relatively low as the proposal seeks to re-establish a scheme recently implemented and based on input from stakeholders. Subsequently, we have assumed that each of the directly impacted businesses would incur 2.4 hours' familiarisation at mean wage for the business category derived from the ONS²⁹. 2.4 hours is chosen to reflect the hours spent on finding out about changes to H&S regulation per business but may be an overestimate of the amount of time needed. We assess the implications of adjusting this assumption in the sensitivity analysis section below.
6. **Lack of stockpiling.** We assume that parallel importers would not gain in the final 12 months (when parallel PPPs could be used but not sold) as they would not be able to import or sell parallel products in this time. It's possible, however, that there would be a spike in parallel imports *before* the cut-off to enable stockpiling for use in the following year. Trade data is not sufficiently detailed to assess whether this happened before June 2023 and, therefore, we do not have evidence to further inform this assumption. If stockpiling occurs, it's likely that the NPV would slightly improve.
7. **No synergies with treated seeds proposals.** We assume no interrelationship between the two proposals as we believe that the impacts of the continuation of treated seeds arrangements is unlikely to have a significant impact on parallel trade. This is because the relevant imported treated seeds could not be imported as parallel products as they do not have GB authorisation. It's possible that removal of these seed treatments from the market in the baseline would exacerbate existing price pressures from the lack of parallel import competition but due to the limited scope of crops for which treated seeds are used, we would expect this impact to be limited.

Treated Seeds

1. **Baseline crop choice.** We assume that many growers of maize in the intervention (i.e., with access to seed treatments) would choose to grow alternative crops in the baseline given the reduced pesticide availability. The chosen crops are based on evidence from stakeholders about the types and mix of crops they would choose to grow in the absence of seed treatments. In general, our approach assumed that growers would take up the least financially risky option which meant predominantly substituting maize with other crops such as wholecrop cereals. Due to time constraints associated with building the evidence base for this analysis, it's possible that the alternative crops chosen are not representative of the behaviour of growers across the industry. In particular, we would expect the benefits from the policy to be higher were a greater proportion of growers to continue to grow maize in the baseline.
2. **No net impact on distributors & manufacturers.** We assume the same profit margin and volume of sale when pesticide distributors & manufacturers switch supply from alternatives to treated seeds. This assumption is made as we do not have sufficient evidence to predict, for all imported treated seeds and their uses, how the volume and value of alternatives may differ. We do not believe that there is 'high-level' evidence to support a change in profit margins or sales value as a result of the proposals. Although this means that we assume no net impact of the proposals to manufacturers and distributors, some individual businesses may lose / gain more than others depending on the products they produce and sell.
3. **Minor veg growers.** We do not estimate the impact on minor veg growers for proportionality reasons. We expect that there would be a subset of veg growers impacted by the loss of seed

²⁹ <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

treatments in the baseline but that the impacts would be isolated to a few crops where alternative products would not be sufficient for pest control. As the scale of the impact is likely to significantly below that for maize, we have chosen not to monetise.

4. **Proportion of AD and cattle businesses growing maize ‘in-house’.** We assume that 80% of cattle farms and 50% of anaerobic digestion businesses grow their own maize. This is based on stakeholder input (for cattle) and a survey of AD businesses³⁰. This has a large impact on the NPV, but we believe the evidence used is robust and, therefore, the level of uncertainty is relatively low. We test these assumptions in the sensitivity analysis below.
5. **Familiarisation cost.** We expect that familiarisation costs would be relatively low as the proposal seeks to maintain the status quo and based on input from stakeholders. Subsequently, we have assumed that each of the directly impacted businesses would incur 2.4 hours’ familiarisation at mean wage for the business category derived from the ONS³¹. 2.4 hours is chosen to reflect the hours spent on finding out about changes to H&S regulation per business but may be an overestimate of the amount of time needed. We assess the implications of adjusting this assumption in the sensitivity analysis section below.
6. **No synergies with parallel trade proposals.** We assume no interrelationship between the two proposals as we believe that the impacts of the reintroduction of parallel imports is unlikely to have a significant impact on maize production beyond the industry wide parallel trade impacts already estimated. This is because the existence of parallel imports only enables growers to access products already authorised in GB and, therefore, does improve access to the treated seeds that would be removed in the baseline.

Sensitivity Analysis

Evidence and assumptions feeding into the modelling have been informed by the best available evidence, findings from existing studies, and expert judgement. There is, however, an inherent level of uncertainty in the assumptions which have been made. The following section attempts to highlight the uncertainty associated with the assumptions which are most sensitive to the model and then assess how changes in these assumptions might affect the expected net present value of the preferred policy option.

Table 6: Sensitivity of net present value to changes in most uncertain assumptions, 2024 base year

Assumption	Change	Option 1 NPV % change (direct impacts)	Option 1 NPV % change (all impacts)	Option 1 NPV £m (direct impacts)	Option 1 NPV £m (all impacts)
Treated Seeds					
Anaerobic revenue loss from sub optimal mix (year 1)	15% to 5%	-8%	-10%	575	835
Anaerobic revenue loss from sub optimal mix (year 2)	10% to 5%	-11%	-14%	556	798
Maize yield loss	40% to 15%	-2%	-1%	612	924
Proportion of cattle farms growing crops 'in house'	90% to 95%	1%	0%	628	929
Proportion of AD operators growing crops 'in house'	51% to 20%	-35%	-3%	405	899

³⁰ [FIGURE 11: AD and Composting Market Survey Report FINAL WRA-009-19 \(wrap.org.uk\)](#)

³¹ <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

Parallel Imports					
Parallel trade proportion of market	3.5% to 5%	0%	0%	623	929
Profit margin non-parallel manufacturers	20% to 30%	-1%	-1%	617	923
Parallel / reference product price difference	18% to 25%	1%	0%	626	932
Both					
Familiarisation hours	2.4 hours to 8 hours	0%	0%	622	928

Anaerobic revenue loss from sub optimal mix

Uncertainty: Evidence provided by stakeholders suggested that the loss of seed treatments and subsequent reduction in maize availability in the feedstock mix would reduce efficiency by 15% (year 1) and 10% (year 2). We do not have comparative estimates to compare against, but we believe that these numbers are likely to be on the higher end.

Sensitivity: Assuming that revenue loss is 5% would lead to a reduction in avoided loss to anaerobic digestion plants relative to the baseline. This would lead to a decrease in the net present value as set out in the table above.

Maize yield loss

Uncertainty: Evidence provided by stakeholders suggested that the average loss in yield associated with growing maize without seed treatments would be 40%. This estimate is highly uncertain due to the nature of yield losses and a lack of precedent where maize has been grown without these seed treatments. Other evidence suggested a loss of 15% to 80%.

Sensitivity: Assuming that revenue loss is 15% would lead to a reduction in avoided loss to maize growers relative to the baseline. This would lead to a decrease in the net present value as set out in the table above.

Proportion of cattle farms growing crops 'in house'

Uncertainty: Evidence provided by stakeholders suggested that 80% of maize crops used by cattle farmers were grown on the farm. This input is sensitive for the direct impacts analysis so we have included to show the impact on the NPV when the proportion is increased.

Sensitivity: Assuming that proportion is 90% leads to a modest increase in the NPV for direct impacts as a greater proportion of farmers are deemed to have benefited 'directly' from the treated seeds policy.

Proportion of AD operators growing crops 'in house'

Uncertainty: Evidence suggests that 51% of maize crops used by AD operators were grown on farms owned by the AD business. This input is sensitive for the direct impacts analysis so we have included to show the impact on the NPV when the proportion is changed.

Sensitivity: Assuming that proportion is 20%, in line with an alternative evidence source, leads to a significant decrease in the NPV for direct impacts as a smaller proportion of AD operators are deemed to have benefited 'directly' from the treated seeds policy.

Parallel trade proportion of the market

Uncertainty: Evidence suggests that between 1% and 5% of the GB market has been supplied by parallel products in a given year. We chose 3.5% as the central value but this may fluctuate depending on exchange rates and manufacturer pricing differentials which can change from year to year.

Sensitivity: Assuming that parallel products supply 5% of the market leads to a negligible impact on the NPV. This is likely because the net impacts of reintroducing parallel trade are estimated to be an order of magnitude lower than the impacts of seed treatment proposals.

Profit margin non-parallel manufacturers

Uncertainty: Profit margins associated with manufacturing of pesticides can vary. Evidence from stakeholders suggested a range of profit margins from 5-45% depending on whether the product was still 'on patent'. We chose 20% as the median of the pricing data obtained but it's possible that this figure could fall within the range set out above.

Sensitivity: Assuming that profit margins for these manufacturers are 30% leads to a modest reduction in the NPV. Again, this is likely to be significant when only looking at the NPV of the parallel trade proposals.

Parallel / reference product price difference

Uncertainty: Price differentials between parallel products and GB reference products (or similar alternatives) can differ depending on exchange rates, product availability and other factors. We chose 18% based on data provided by industry.

Sensitivity: Assuming that this price differential is 25% leads to an increase in the avoided cost increase to growers from the proposals and, therefore, a small increase in the NPV.

Familiarisation hours

Uncertainty: We initially assume that firms impacted by the proposals will require 2.4 hours of FTE to familiarise themselves with the new arrangement. This number is relatively low given the potential scale of change (especially for treated seeds) so we have tested a higher value.

Sensitivity: Assuming the familiarisation time is 8 hours leads to a modest reduction in the NPV as set out in the table.

High / Low Analysis

We used Monte Carlo simulation to account for uncertainty in the assumptions and inputs used in the analysis. To do this, we carried out the following steps:

1. Defined probability distributions across a subset of the key inputs in the analysis. This was usually a normal distribution with upper and lower bounds of the inputs assumed to be at 2 standard deviations from the mean. We obtained the assumptions for the upper and lower bounds based on ranges of values found in the evidence base for a given input.
2. Randomised the inputs over the defined probability distributions and recorded the resulting social net present value.
3. Repeated step 2 for 10,000 iterations.
4. Ranked the list of NPVs from step 3 and selected the 5th and 95th percentile NPVs.

The 5th and 95th percentile NPVs are chosen as the low and high values to reflect the range within which we have relatively high confidence that impacts will fall. The results from this high / low analysis are shown in the summary table in the Summary Figures section.

Risks and mitigations

We have identified the following risks and mitigations associated with the preferred option:

Table 7: Risks and mitigations of the preferred option

Risk	Mitigation
Risk of negative impacts on environmental and human health as a result of pesticide use enabled by the proposals.	The GB regulator (HSE) will continue to integrate parallel products and treated seeds into their monitoring and enforcement regime to deter and prevent import and use of some potentially harmful products. The short-term, temporary nature of the intervention will mitigate the potential risk of prolonged, serious environmental damage. We will

	<p>also work with HSE to develop mitigations which reduce the risk of serious environmental damage resulting from the use of seed treatments that pose an increased risk to the GB environment. For example, working with industry to promote best practice and stewardship in the use of treated seeds.</p> <p>We will encourage applications for authorisations by GB manufacturers to develop the domestic product and reduce dependence on imports of treated seeds.</p> <p>Were serious impacts to the environment to be identified, HSE has the power to prevent use of the offending product under Article 49 of Regulation (EC)1107/2009.</p>
There is a risk that price rises resulting from lack of parallel competition would not materialise in the baseline. This would significantly weaken the case for intervention with regards to reintroduction of parallel permits.	<p>We have sought evidence from a range of stakeholders and data sources to better understand the likelihood of price rises without parallel trade and applied economic principles where evidence is limited.</p> <p>The short-term nature of the extension was also chosen to limit the impact of a lack of price rise in the baseline.</p>
There is a risk that delays to the legislative timetable would mean seed treatments could not be imported in time for spring sowing in 2024.	<p>We have used expedited processes wherever possible and allocated additional internal resource to deliver to a shortened timeline.</p> <p>We are also aware that industry have made applications for emergency use of some products which could mitigate some of the impact of delays if authorisations were granted.</p>
There is a risk that parallel importers do not reapply for permits due to the short-term nature of the extension which could reduce the benefits of implementing the policy.	<p>We have consulted HSE on this risk and have agreed to waive fees for applications, underwritten by Defra. This reduces the barriers for application and HSE are confident that this will ensure that those who can take advantage will do so.</p>

Impact on small and micro businesses

The policy options will impact a range of different sized businesses. We would expect that small and micro businesses will be positively impacted by the proposed changes and that the costs of the changes will predominantly fall on medium to large businesses and the public sector. Therefore, applying an exemption to small and micro businesses would likely be counterproductive to the policy and would not prevent costs falling on small or micro businesses. In addition, as the preferred option is an extension of a transitional arrangement this would give any small and micro businesses negatively impacted by the end of the transition more time to adjust for when the measures do finally expire.

In the rest of this section, we summarise the size of the impacted businesses along with a brief explanation of the expected impact on each group:

- **Farms.** Most farms employ fewer than 10 full time equivalent (FTE) employees. According to the Farm Business Survey⁹⁵, only 14% of farms employ more than 5 employees and it's likely that the majority of these do not employ more than 50 employees which means that the majority of farms are either micro or small businesses. We estimate that the policy proposals will positively impact farms by reducing the cost of PPPs and improving productive efficiency. Therefore, the small and micro farm businesses will not incur costs due to the policy proposal.

- **Parallel Importers.** Industry experts advise that the vast majority of parallel importers are small and micro businesses. This is due to the nature of the business as opportunistic and trading relatively low volumes of product. As we expect that parallel importers will be positively impacted by the proposed measures, the small and micro businesses in this category will not incur costs relative to the baseline and, therefore, not mitigation measures are required.
- **Manufacturers and distributors of PPPs.** Industry experts advise that the majority of manufacturers are of medium size or above, with the majority of the PPP manufacturing market dominated by a small collection of very large multinational companies with subsidiaries registered in the UK³². Distributors tend to be smaller, however, and it's likely that a proportion of businesses impacted employ between 5-50 FTE, classified as 'small'³³.

We estimate that manufacturers and distributors of non-parallel PPPs are likely to be net negatively impacted by the policy proposals. Specifically, by losing profit from sales of products that would be substituted by parallel imports. As parallel imports only comprise ~3.5%³⁴ of the market and distributors typically supply a range of products (often including parallel products), we do not expect that the cost to the individual small businesses in this group will be significant. Again, as many distributors sell both non-parallel and parallel products, they would have the opportunity to offset potential losses arising from substitution by establishing routes to market for parallel products. This conclusion is supported by comments from the central industry body in the UK that represents over 90% of distributors (of a range of sizes) that expressed support for parallel trade.

- **'Amenity' businesses.** A huge range of businesses use PPPs for 'amenity' purposes. This could range from micro-sized golf courses to large warehousing companies with hundreds of FTE employees. As the impacts of the proposals are likely to be positive, and limited in scale, we have not done further analysis to identify the size of businesses within this group that would be most impacted.
- **Anaerobic Digestion Businesses.** The largest AD businesses are likely to be at least medium in size, employing at least 50 FTE. For example, the two biggest AD producers operate >20 plants between them, each of which will likely require at least 5 members of staff, on top of the staff required in central offices. The remaining AD businesses are likely to be small businesses. Data from WRAP³⁵ suggests the following breakdown by site:

Table 8: Number and FTE of anaerobic digestion sites in the UK

	Farm	Commercial	Industrial
Number of sites	252	87	33
Number of FTE	779	115	487
FTE per site	3.1	1.3	14.8

Although some businesses will likely operate multiple sites, this data shows that it's likely that most AD businesses are in the micro to small range of size. We estimate that the impacts of the policy proposals to AD producers will be positive and, therefore, the small and micro businesses in this sector will not incur cost.

Wider impacts

Public sector operating and enforcement costs

For the parallel trade proposals, the GB regulator (HSE) has advised that the total one-off cost of processing the permits (based on an estimate of circa 330 applications) is between £127,050, which is the value it would have collected from application fees, and £180,000, which is the value it has provided as its actual operating costs to deal with the parallel permits. The administrative cost will be absorbed by

³² One estimate suggests that 4 companies hold 80% market share between them in the UK.

³³ We do not have sufficient evidence to give a specific proportion.

³⁴ Estimate provided by stakeholders

³⁵ [AD and Composting Market Survey Report FINAL WRA-009-19 \(wrap.org.uk\)](https://www.wrap.org.uk/ad-and-composting-market-survey-report-final-wra-009-19)

HSE from existing budget allocations. For seed treatment proposals, HSE have advised that no additional operational costs would be required relative to the baseline.

For enforcement, no additional resource would be provided to HSE to carry out additional enforcement checks on behalf of the proposals. We, therefore, have not included any additional costs for enforcement in the appraisal. Please refer to the Impacts to the environment and human health (unmonetised) section below for more details on enforcement plans.

Impacts to the environment and human health (unmonetised)

Parallel Trade

The main risk to the environment and human health from reintroducing parallel permits is that PPPs could come into the GB market that contain contaminants, impurities, or incorrect active concentrations relative to the formulation of the reference product. Where these PPPs are used in GB, the contaminants, impurities, and incorrect active concentrations could lead to environmental damage and negative consequences for human health.

The risk of this happening for GB authorised products is lower as there is greater transparency in the process of bringing a product to market. This means that manufacturers, permit holders, and marketing companies have an incentive to ensure the product they produce and sell meets the requirements of the authorisation. In addition, for parallel permits, there is often no relationship between the authorisation holder of the reference product, the permit holder of the parallel product, the manufacturer of the parallel product, and the importer. This means that, were non-compliance identified, the cost to parallel importers may be lower than for other parts of the supply chain, meaning the incentive against compliance is not as strong.

Estimating the size of this risk is extremely difficult both in terms of frequency of noncompliance and the environmental / human health risk associated with a given case. Since 2017, there have been 24 parallel PPP permits withdrawn as a result of enforcement action. However, due to the targeted nature of enforcement activity and the limited historical resource to form a valid baseline, we cannot infer a rate of compliance from these figures, aside from confirming that noncompliance to parallel permit regulations exists.

The GB regulator (HSE) has previously used two different routes to check compliance and enforcement which will remain in operation for new permits granted.

The first is chemical checks on formulations through the 'annual formulation survey'. The products are selected on the basis of the actives they contain. A small proportion of parallel trade products are captured through this survey. The second is reactive enforcement (where there are reports - often via intelligence from manufacturers - that products are not identical to the GB reference product).

It should be noted that these methods are likely not sufficient to identify and enforce against all non-compliance events.

Seed Treatments

The GB regulator, HSE, have advised that determining the potential impacts of the import of treated seed, in particular the environmental impacts, is not possible to do due to data limitations, regardless of the timescale proposed.

The central difficulty is that HSE does not know all the treated seed imports as there is no requirement for importers to report them. The ones which we are aware of are restricted to those which have been submitted to us as Article 53 emergency applications. At the moment, this is confined to those relating to the treatment of maize seed.

On human health risks, the GB regulator (HSE) shared the following analysis:

From a consumer risk point of view, for active substances that are non-systemic, we would not have too much concern. For systemic actives, the impact on consumers could be variable. Generally, residues are very low following seed treatments, and it would be rare for there to be any consumer risks. Provided the assessment by an EU Member State has taken note of the relevant EFSA Conclusion/ reasoned opinion,

there is unlikely to be any risks to UK consumers and the difference in approach for the chronic risk taken in the UK, compared to the EU, is unlikely to have an impact. Of course, you can never exclude a risk completely, and potential metabolites may pose a risk to consumers. But overall, it is unlikely there will be a significant impact for UK consumers from importing treated seeds from the EU.

On environmental risks, the main potential environmental impact is that seed treatments could be used in GB that present a risk to the environment due to differences in the way the risk assessment is applied in GB relative to the EU and the different context of use arising from GB vs EU conditions (e.g. climate, soil type, species).

The GB regulator (HSE) has advised that the main environmental assets likely to be affected are species and wildlife. The nature of the risk for species and wildlife is that non-target organisms, such as birds and mammals, may ingest the treated seeds for food. This exposure could impact their reproductive systems and other key functionings, potentially causing mortality and knock-on impacts to the health of wildlife populations.

The probability of these impacts occurring is likely to be low. This is because:

- Where potential risks from ingestion are identified, seed treatment products are likely to stipulate conditions for use that minimise the likelihood of ingestion which are enforced by HSE under new Official Controls Regulations.
- Treated seeds are often expensive which means that growers have an incentive not to leave seed unplanted.
- All seed treatments would have passed authorisation regulators in an EU Member State. Although, as highlighted above, some products may present unique risks in GB conditions, this is likely only to be the case for a subset of all seed treatments being imported.
- The policy being reintroduced has been in place over a long period time with no evidence of significant negative impacts to the environment as a result of the policy. The proposed arrangements would be in place for a comparatively short period of time.
- Where serious impacts to the environment are identified, HSE has the power to prevent use of this product under Article 49 of Regulation (EC)1107/2009. Subsequently, it's likely that any serious environmental damage that does occur would be short-term.

The scale of any impact that does materialise is likely to be limited and localised. As explained above, situations where there is exposure to wildlife will likely happen where growers do not follow appropriate mitigations and / or there are no appropriate mitigations. The most widespread seed treatments that we expect to be imported and used are those for Maize, which covers >200,000 hectares each year. The GB regulator has advised that the conditions for use associated with these treatments are likely to be effective in mitigating the risk to non-target organisms. Subsequently, we would only expect localised impacts from the subset of growers that do not follow these conditions.

The continuation of seed treatment arrangements may also have knock-on impacts to methane emissions derived from livestock production. Methane makes up half the carbon footprint of milk production, and the same with beef production. The use of maize in rations has been shown to improve efficiencies, in turn helping to reduce methane production by as much as 6% per kg of milk. However, there is also evidence that shows limited impact of maize rations on methane production per kg output from dairy cows.

A key evidence gap which prevents us from being able to make a robust assessment of the impact of maize rations on methane and greenhouse gas production is the lack of a full life-cycle assessment to compare the emissions arising throughout the production process from using maize rations. One concern raised by recent studies is the impact of growing maize as cattle fodder on soil carbon. Relative to grass silage, soil is usually ploughed each season to sow maize seed which releases soil carbon stocks into the atmosphere. It's possible that these emissions would outweigh any methane savings from livestock consuming maize rations.

Potential price rises from removal of parallel competition (unmonetised)

In theory, removing parallel products (and the 'threat' of parallel products that have permits but are not used) reduces the level of competition in the market, giving manufacturers of GB reference and alternative products incentive to increase prices in areas of low competition to maximise profit³⁶.

We interpret the impacts on the intervention option of these potential price increases in the baseline as second order and indirect, as follows:

- Manufacturers & distributors of non-parallel PPPs lose profit equivalent to that made due to price rises in the baseline;
- Farmers gain avoided cost from not paying for price rises relative to the baseline; and
- Amenity users gain avoided cost from not paying for price rises relative to the baseline.

Available evidence on price changes

The evidence on the extent to which price rises might occur in the baseline is limited and uncertain which means we have not been able to provide monetised estimates of the impacts with high confidence (although we do present a best-estimate scenario below). One way to understand the likely impact on prices of removing parallel imports is to assess how prices of GB reference products have changed since June 2023 when parallel products could no longer be sold in GB. To do this, we would need representative data that demonstrates prices of parallel and non-parallel products over time.

Evidence provided by the agricultural sector has shown price differentials of up to 30% between a handful of products in GB vs EU launched after new parallel permits could be issued and UK prices were found to be 21% more than median EU prices in a wider (but still limited) basket of products. In contrast, price data and anecdotal evidence shared by manufacturers indicates that price differentials between reference products in GB vs EU are often variable and GB pricing has not changed for products previously under parallel competition.

Although this evidence is useful to show the range of pricing across the sector, the limited number and anecdotal nature of examples and the likely inclusion of bias means that a robust conclusion cannot be drawn from these evidence sources. Due to the short timescale available to gather representative evidence and limitations in access to market-wide product price data, we have not been able to assess how prices of GB reference products have changed since the end of parallel trade.

Analysis based on economic theory

Economic theory suggests that price increases relative to the intervention, where parallel trade is permitted, will depend on (a) the level of competition in a given PPP subsector, (b) the upper limit of willingness to pay (WTP) for GB buyers, and (c) the WTP of GB buyers relative to EU buyers.

Regarding competition, we estimate that (as of June 2023) there were 51 parallel products for which there were only 1 competing firm³⁷ with products with the same active and target crop list. These products are used across a wide range of crops (see Annex 1 – Price Change Analysis) with oilseeds, peas & beans, cereals, and strawberries likely to be most significantly impacted. As competition would be limited for these crop protection 'spaces' in the absence of parallel trade, economic theory would suggest that there is an incentive for manufacturers of these reference products (and similar alternatives) to increase prices to maximise profit.

The extent to which manufacturers act on this incentive depends on whether there is sufficient WTP from buyers of the products in GB to make price increases profitable³⁸. This depends on several factors explored below.

³⁶ Note that the 'price increases' we refer to are not the existing differences in prices between parallel and GB reference (or similar alternative) products, but the potential for manufacturers to further increase the price of GB reference products and alternatives beyond current prices, in the absence of parallel competition.

³⁷ i.e., the seller of the reference product.

³⁸ i.e., increasing prices doesn't lead to substantial falls in volume sold.

- **The financial situation of the buyer.** From an agricultural perspective, the UK produces food at some of the lowest cost globally and many farms are loss-making without subsidies that are declining year-on-year. This means that they do not have much financial freedom to absorb higher costs. This is particularly the case in the context of rising input costs and anecdotal evidence from manufacturers indicates that many GB buyers have reached the top of their WTP, with many growers opting to significantly reduce pesticide and fertiliser use.
- **The importance of the product to the buyer.** Different countries face different pest pressures, grow different crops, and have different needs for PPPs. It's therefore likely that they will be willing to pay different amounts for a given crop protection tool due to its importance to their production process. The availability of substitute pest control options will also be a key factor in determining the importance of the product and therefore how much a buyer is willing to pay. For example, if using non-chemical IPM methods is a viable and effective alternative then the marginal benefit from buying the product is lower.
- **Non-price competition.** Anecdotal evidence suggests that historically many GB buyers continued to purchase the more expensive GB reference products even when parallel products were available. This indicates that buyers were choosing the 'branded' product for another reason other than price. This could be the 'free' provision of cropping and application advice, for example. It's possible, therefore, that existing pricing of many GB reference products is already at the optimal level for profit making.

Finally, relative to the baseline, there would only be a difference in GB product prices if a sufficient price differential exists between the EU and GB reference product for parallel imports to come into the market in the baseline. This will depend on both the logistical cost of sale and the differences in WTP between countries. These differ by product and country of origin but it's likely that only a portion of the 51 'low competition' products above will exist in such conditions.

In summary, according to economic theory, price increases of GB reference products and similar alternatives due to reduced competition in the absence of parallel trade is possible but likely to be limited. This is because (1) only a few crop protection spaces face lack of competition, (2) GB buyers may often not be willing (or able) to pay higher prices, and (3) sufficient price differentials may not materialise in the baseline for parallels to take advantage in the intervention scenario. This being said, where price increases do arise, this could have a significant impact on farmers operating with these products and could impact some sectors more than others.

Best-estimate indicative scenario

For indicative purposes, we have constructed a scenario that we think reflects a reasonable approximation of the likely cost to the agricultural sector from price increases due to low competition. To do this, we make the following assumptions:

- Manufacturers and/or distributors of pesticide products would increase prices if there were no competition from another firm in a given crop protection 'space'³⁹.
- 12% of the reference products and alternatives to the 'low competition' products will exist in the appropriate conditions for price rises⁴⁰.
- Prices of these reference products and alternatives would rise by 15-30% due to low competition.

This leads to a £2-4m cost to the agricultural sector in the baseline due to reduced competition arising from the end to parallel trade (and therefore would reflect an avoided cost in the intervention). Were this avoided cost to be included in the cost benefit analysis, the NPV of the preferred option would not change as the avoided cost would represent a transfer from manufacturers to farmers.

Note that this estimate is intended as an indicative approximation of the potential impact and carries high uncertainty. A table showing the breakdown of costs to each crop group is shown in Annex 1 – Price Change Analysis alongside more detail about the methodology behind the calculations and the associated caveats.

³⁹ This assumption is grounded in standard economic theory of the firm.

⁴⁰ The percentage value is based on the proportion of firms that hold permits that actively imported pesticides between 2020 and 2022 multiplied by stakeholder evidence on the proportion of permits within a firm that are used.

Estimated worst-case impacts on individual farmers

As mentioned, it's possible that the absence of parallel trade (and subsequent price rises) could affect some farmers more than others. Below, we build a potential 'worst-case' scenario that an individual farm growing oilseed rape might face as a result of the end of parallel trade. Oilseed rape was chosen as it is the crop most commonly treated by the active substances found in 'low competition' parallel products (see Annex 1 – Price Change Analysis). The following steps and assumptions are made:

- For the average grower of oilseed rape, they have a gross margin of £1,188 per hectare and PPP costs comprise 38% of their variable costs⁴¹.
- We assume that 2 of the 5⁴² PPPs they use were previously parallel imports⁴³.
- We assume that switching to reference products would involve an 18% increase in price based on existing price differentials⁴⁴.
- We assume that manufacturers further increase the price of these products by 75%⁴⁵.
- **This would lead to a 14% increase in variable costs and a 6% (£71 per ha) fall in the gross margin of growing the crop.**

Note that growers will likely receive revenue from other crops and business activities, so a drop in gross margin for oilseed rape will comprise a smaller proportional drop in total gross margin. For example, if a farm were to grow oilseed rape on a 4-crop arable rotation, at any given time ~25% of their farm area is used for growing oilseed rape, on average. Conversely, however, growers will also face substantial fixed costs which means per hectare profits will be lower than the margins set out above imply. Subsequently, the £71 per ha increase in costs may have a significant impact on their profits.

Using the average area of a general cropping farm⁴⁶, assuming 25% is used to grow oilseed rape, and taking the average farm business income of a general cropping farm (£84,442)⁴⁷, we estimate that this scenario would lead to an 3% fall in farm business income.

For the worst-performing farms that operate near or below the profit-line, this cost increase is likely to be much more significant. In the case of the 25th percentile general cropping farm (FBI = £-10,287)⁴⁸, this scenario would lead to a 21% increase in losses⁴⁹. Given the context of rising input prices across the agricultural sector, an increasing number of farms are seeing their profitability come under pressure. These farms would struggle to absorb further losses in profits, even if relatively modest.

Finally, it is important to note that increases in inputs costs of growing one particular crop may lead to behaviour change by farmers to grow a different crop in its place, reducing the impacts on profit. This depends on (a) the timing of price increases and whether a change in crop could be made and (b) the suitability of other crops in the rotation. It's also possible that where prices might increase for a product(s) used widely across an agricultural subsector (e.g., soft fruits) that this would lead to a drop in production or reduction in viability across the sector.

CMA assessment of impacts on PPP competition

As discussed above, the reintroduction of parallel trade could lead to an increase in the level of competition in the GB market for PPPs. As per CMA guidance, we have completed the initial competition

⁴¹ Source: Farm Business Survey, 2021/22

⁴² Approximation based on online research and anecdotal stakeholder evidence

⁴³ The select of 2 PPPs is roughly based on information about the parallel PPPs available for use on this crop.

⁴⁴ Source: Price differential established from confidential stakeholder evidence

⁴⁵ Source: Based on the upper bound of suggested price increases from stakeholders.

⁴⁶ Source: Farm Business Survey, 2020/21

⁴⁷ Source: Farm Business Survey, 2020/21

⁴⁸ Source: Farm Business Survey, 2020/21

⁴⁹ This assumes that the 25th percentile general cropping farm has the average general cropping farm area.

checklist. As the answer to each of the questions in the checklist is no, we have not completed a further assessment.

1. Will the measure directly or indirectly limit the number or range of suppliers?

No, the measures will increase the number of suppliers in the market as parallel import companies will enter the market.

2. Will the measure limit the ability of suppliers to compete?

No, the reintroduction of parallel import products and seed treatments into the GB market will not impact the ability of suppliers to compete.

3. Will the measure limit suppliers' incentives to compete?

No, the reintroduction of parallel import products and seed treatments will likely increase the incentives for suppliers to compete as additional suppliers will enter the market (often pricing below incumbents, in the case of parallel imports).

4. Will the measure affect consumers' ability to engage with the market and make choices that align with their preferences?

No, we expect that the measures will have no negative impact on consumers' ability to engage with the market and make choices that align with their preferences.

5. Will the measure affect suppliers' ability and/or incentive to introduce new technologies, products or business models?

On balance, we do not expect that the impact of the proposed measures will significantly alter the incentives of suppliers of PPPs to introduce new technologies, products or business models. We explore this further in the section below.

Impacts to consumers (unmonetised)

It's likely that a proportion of the cost saving to farmers and amenity users from the proposed measures would be passed onto consumers through an avoided price increase in food and amenity services.

Specifically, for parallel trade, we would expect this cost saving to be experienced across a wide range of products and services as parallel products are used by a range of farmers on different crops and amenity users for different purposes. Given the relatively low cost saving to farmers and amenity users across the intervention, however, we would expect the impact on consumers to be small. We would also not expect any impact on the range of goods available to consumers.

For treated seeds, as the proposals will likely predominantly affect maize production, we would expect the impact on consumers to fall on beef, dairy, and energy prices. As the scale of the overall impact is expected to be relatively large, it's possible that the impact on consumer prices may be significant. In addition, there may be impacts on prices for other products (such as minor veg crops) grown in GB that use treated seeds imported from the EU. Although prices may change and GB production may rise, we would not expect a significant impact on the range of goods available to consumers as any shortfalls in domestic production in the baseline would likely be met by imports.

As mentioned previously, the extent to which the cost savings to farmers are passed onto consumers depends on contracts between farmers, distributors, and retailers. This is highly uncertain and depends on a number of factors that are outside the scope of this analysis. Consistent with RPC guidance, we interpret any price changes as an indirect impact and, therefore, assume the net impact to consumers of the proposal is zero.

Impacts on innovation and research and development

Manufacturers of PPPs have suggested that reintroducing parallel trade could devalue the UK marketplace as a place for investment in product development and registration. This is significant in the context of manufacturers facing additional registration costs from registering in the UK in addition to EU

countries, due to EU Exit. A reduction in investment in the UK marketplace could lead to a reduction in the number of new products coming into the market to better tackle existing and emerging pest control issues. This could have a series of impacts as below:

- Lower yields and profits for farmers leading to reductions in food production with potential implications for food security.
- Less effective pest control for amenity users, leading to knock-on impacts to profits and amenity consumers.
- Higher chance of resistance developing to existing active substances and modes of action.
- Environmental / human health impact as some new pesticides with lower environmental impact may not come onto the market.

Industry stakeholders have specifically highlighted the minor and speciality crop sectors as areas that could be affected by the change as investment in product renewals is about to start and the business case for investment is already marginal.

The extent to which the proposed extension would have a significant impact on innovation in the sector is uncertain, however. As the extension is only for a further 2 years and product development can take up to 20 years, it's likely that the medium-long term effect on innovation of PPPs will be limited, although it's possible that some specific crop sectors in GB may receive lower PPP investment in the short-term.

The continuation of seed treatment imports may also impact innovation and R&D of alternatives to the imported seed treatments. On one hand, continuing to allow the use of imported seed treatments reduces the incentives for growers and the agricultural industry to develop solutions to control the relevant pests without use of the unauthorised seed treatments. The existing transition period has not brought about significant innovation to end the reliance on the imported seed treatments which indicates that extending the transition period further may have similar limited impact.

On the other hand, the sector has argued that additional time is needed for replacement products to come onto the GB market (either through EU-authorized products obtaining GB authorisation, which is not guaranteed, or in the form of a new formulation) and for non-chemical control methods to be developed. An extension to the transition arrangements would give more time for these solutions to come onto the market, although there are no guarantees that this would be possible in the timeframe.

On balance, therefore, it is difficult to estimate the impact of these measures on innovation as there are multiple factors at play that could influence innovation and R&D investment in opposite directions. Due to the time-limited extensions, we believe that any impact is likely to be marginal.

Distributional impacts

Consistent with the analysis above, the parallel trade measures will predominantly affect farmers and the agricultural sector. We expect that the impacts (positive and negative) will be distributed evenly across agricultural regions in GB. This is because parallel products could potentially be imported for a wide range of uses.

For treated seeds, the impacts are likely to be more concentrated in the maize growing, dairy, and anaerobic digester regions in GB. As maize is usually grown 'on site' or locally to its use (high transportation cost), it's likely that the regions where maize is grown are likely to be most significantly impacted by the policy.

Information from the AHDB⁵⁰ suggests that "most of England is suitable for growing maize for silage, with only areas in the far north and the wetter, more exposed west regarded as 'marginal'". Maize can be grown successfully in marginal regions but requires drilling under degradable film to encourage germination. Subsequently, we would expect the majority of the impacts of the policy to fall on the midlands, east, and southwest of England with more minor impacts on other regions where Maize is grown in smaller quantities or where other seed treatments are used.

⁵⁰ [Where to grow maize | AHDB](#)

A summary of the potential trade implications of measure

We estimate that the value of parallel trade imports is £22m per year. Overall, it's likely that the volume of trade will increase slightly as a result of the measures. This is because, in the baseline where parallel permits are not allowed, a small proportion of currently imported parallel products would likely be substituted by domestically manufactured alternatives. In the intervention, these domestically produced products would be substituted by parallel imports, thereby increasing trade. We do not have sufficient evidence to estimate the extent to which this might happen although it's likely to be <10% of the <£22m worth of imports each year.

For seed treatments, because the active substances and corresponding seed treatment products currently imported under the previous arrangement do not have authorisation for use in GB, most firms looking to supply the GB market with substitutes would need to apply for authorisation from the GB regulator, the HSE. This would take a long period of time and there is no guarantee of application being successful. We do not have information to suggest that HSE have received any applications for products that are currently imported or that would serve as substitutes.

For this reason, it's likely that implementation of the proposed measures is likely to bring about a positive (liberalising) impact on the quantity of trade from EU countries in the form of higher imports of seed treatments, relative to the baseline where these seed treatments cannot be imported.

There are two possible avenues through which this liberalising impact may be reduced:

1. It's possible that, in the baseline, some seed treatments or other non-seed treatment PPPs on the GB register (i.e., with a different chemical composition) may be imported as substitutes which would reduce the impact on trade. Industry have suggested, however, that there are very few suitable products available that would work as substitutes and so we would not expect these trade flows to be significant.
2. It's likely that some manufacturers will apply for emergency authorisations for limited use of the unregistered seed treatments in GB for a growing season. Where this happens, it's likely that the products would be imported and, therefore, the trade liberalising impact of the proposed measures would be reduced. Given the requirement for use to be authorised for no more than 120 days, it's again unlikely that this would have a significant impact on trade flows.

Consideration has been given to the need to notify the measures to the WTO TBT Committee. As we are introducing short-term, temporary measures that seek to either extend or reinstate transitional arrangements, we have concluded that do not need to notify the WTO on the grounds that only products that were previously allowed to be imported are in scope and, therefore, the proposal does not meet the required criteria of significant impact to trade.

More information on trade impacts is provided in the Trade Risk Assessment⁵¹.

Monitoring and Evaluation

A post-implementation review (PIR) is not required for this legislative change. This is because the SI is being laid using powers in the REUL Act and is therefore exempt from the requirement to include a review clause. This means that in relation to this amending SI, no PIR will be needed in the future.

We will, however, conduct a light-touch assessment of the extent to which the policy objectives have been met by the end of the intervention. This will be done through a range of analytical techniques, using evidence and data to estimate the impact of the policy on key indicators, such as PPP prices and dairy farm profits. The main intention of this assessment would be to inform future policy development, especially in relation to developing long-term solutions to the issues that the proposals aim to address. This assessment will not be published.

To conduct this assessment, we will use the following sources of evidence:

⁵¹ Note that this has not been published

- Anecdotal feedback from stakeholders on the impact of the proposals and provision of data where possible.
- Data on PPP prices from proprietary sources and stakeholder input.
- Business-level HMRC data on PPP trade
- Farm business survey data on farm performance, especially relating to dairy farms and arable farms growing maize.
- HSE compliance data.
- PUS data on pesticide use at active substance level.
- Financial data for the anaerobic digestion sector derived from online sources and stakeholders

Due to the short intervention period, we do not plan to conduct an assessment against the policy objectives before the end of the intervention. This is because we will need time to collate sufficient evidence to make the assessment and also because the impacts of the proposals may not be fully realised so soon after implementation.

We would consider reviewing the policy proposals sooner on the following grounds:

- Significant impacts to environmental and human health risk were identified by HSE that derived from the implementation of the policy
- Significant impacts to crop security were identified for the key target sectors of the proposals despite the implementation of the policy.
- Notable increases in operating costs and food prices for businesses and consumers arose due to specified limited pest control options, despite the implementation of the policy.

Annex 1 – Price Change Analysis

In the table below, we show the proportion of each crop group that is treated by products previously under parallel competition with no other competitor firms in the same pest control ‘space’ (we refer to these PPPs as the ‘limited competition PPPs’⁴).

The ‘Max Proportion’ column shows the estimated proportion of each crop group that was treated by at least one of the products in the ‘limited competition PPPs’ group. The ‘Treated Crop Value’ column is the value of the crop treated by at least one product⁵. And the ‘Cost_Low’ and ‘Cost_High’ columns show the indicative range of costs arising from price increases to the ‘limited competition PPPs’.

Where data is missing, this value is shown as “-“ but the value in reality will be > 0.

Table 9: Treated proportions, crop production value, and costs estimates for crops treated with ‘limited competition PPPs’. Values in £m 2023.

cropgroup	Max_Proportion	Treated_Crop_Value	Cost_Low	Cost_High
oilseeds	76%	546	2	4
peas & beans	73%	53	0	0
cereals	73%	2,313	8	17
strawberries	71%	240	1	2
other soft fruit	65%	128	0	1
lettuce, endive etc.	63%	122	0	1
carrots, parsnips etc.	59%	132	0	1
cucurbits	58%	-	-	-

orchards	57%	137	0	1
potatoes	46%	351	1	3
root crucifers	36%	-	-	-
protected edible crops	35%	-	-	-
other outdoor vegetables	33%	42	0	0
brassicac	33%	76	0	1
other root vegetables	22%	6	0	0
onions & leeks	19%	37	0	0
pulses	4%	5	0	0
other fodder crops	2%	-	-	-
sugar beet	1%	3	0	0
sweetcorn	0%	-	-	-
Partial Total	-	4,191	15	30

The table shows that oilseeds, peas & beans, cereals, and strawberries are likely to be the crops that rely most heavily on the 'limited competition PPPs' group. However, many other crop groups are also widely treated by these PPPs as seen by the relatively high values in the Max_Proportion column.

In terms of cost, this analysis suggests total (partial) costs of £15-30m per year from price increases of these products assuming that all the products would exist in the appropriate conditions to enable price increases. These costs predominantly arise from cereals, oilseeds, and potato crops due to their large-scale production in the UK and relatively high treated proportions.

For the figures in the *Potential price rises from removal of parallel competition (unmonetised)* section, we multiply this £15-30m range by ~12% to reflect the likelihood that not all 'low competition' products will exist in the appropriate conditions to enable manufacturers to increase prices. This results in a cost of £2-4m.

Please note the following caveats:

- The figures do not account for the degree of importance of the limited competition PPPs to each crop group. i.e., although the products are used by a large proportion of growers, the pest issue may not be severe / there may be non-chemical methods that could be used instead.
- The treated proportions and corresponding production values may also be overestimates of the proportion of each crop group that use on these 'limited competition PPPs'⁵².
- The cost estimates are based on the following assumptions: *on average across all crops*, (1) PPP costs are 12% of crop production revenue⁵³, (2) each crop is treated with 5 different PPPs⁵⁴, (3) price increases will range from 15-30% for 'limited competition PPPs'⁵⁵.

⁵² a. The Max Proportion column does not exclude PPPs that use the same active(s) and treat some of (but not all) the same crops as the limited competition parallel PPPs.

b. There may be alternatives to the 'limited competition PPPs' that use different active substances which will not be accounted for in assessing the level of competition for a given parallel product.

⁵³ Table 14.1 of [Farm accounts in England - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

⁵⁴ Based on online research and anecdotal stakeholder evidence

⁵⁵ Reasonable range of suggested price increases from stakeholders

Annex 2 – List of key seed treatments not authorised for use in GB

Table 10: Key seed treatments highlighted by industry that are authorised for use in the EU but not GB.

Species (common name)	Seed treatment product name	Active ingredient	GB alternative
Maize (silage)	Redigo M	metalaxyl and prothioconazole	None
Maize (energy)	Redigo M	metalaxyl and prothioconazole	None
Maize	Korit	ziram	None
Broad Bean	Beret Gold	Fludioxonil	None
Climbing Bean	Beret Gold	Fludioxonil	None
Dwarf French Bean	Beret Gold	Fludioxonil	None
Runner Bean	Beret Gold	Fludioxonil	None
Chilli Pepper	Topsin	Thiophanate-methyl	None
Florence Fennel	Maxim 480 FS	Fludioxonil	None at present
Chinese Cabbage	Maxim 480 FS	Fludioxonil	Available
Chinese Cabbage	Apron XL	Metalaxyl-M	None at present
Chinese cabbage	Prepper 480 FS	Fludioxonil	Available
Spring Cabbage	Apron XL	Metalaxyl-M	Available
Sprouting Broccoli	Apron XL	Metalaxyl-M	Available
Winter Cauliflower	Apron XL	Metalaxyl-M	Available
Winter Cauliflower	Maxim 480 FS	Fludioxonil	Available
Cauliflower (Summer)	Apron XL	Metalaxyl-M	Available
Borecole	Prepper 480 FS	Fludioxonil	Available
Brussels sprouts	Prepper 480 FS	Fludioxonil	Available
Red Cabbage	Prepper 480 FS	Fludioxonil	Available
Pak Choi	Apron XL	Metalaxyl-M	None at present
Pak Choi	Maxim 480 FS	Fludioxonil	Available
Spinach beet / chard	Maxim 480 FS	Fludioxonil	Available for permanent protection with full enclosure (PPFE) only
Radicchio	Maxim 480 FS	Fludioxonil	Available
Marrow/courgette	Maxim 480 FS	Fludioxonil	None at present

Pumpkin	Maxim 480 FS	Fludioxonil	None at present
Winter Squash	Maxim 480 FS	Fludioxonil	None at present
Bunching Onion	Maxim 480 FS	Fludioxonil	Available
Carrot	Prepper 480 FS	Fludioxonil	Available
Sweetcorn	Maxim 480 FS	Fludioxonil	None
Sweetcorn	Redigo-M	Prothioconazole, Metalaxyl	None